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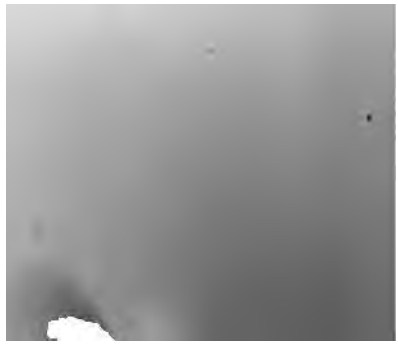
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"THE STATE BOARD OF HEALTH AND VITAL STATISTICS OF
THE COMMONWEALTH OF PENNSYLVANIA."

BENJAMIN LEE, M. D.,
Secretary.

1532 PINE STREET, PHILADELPHIA.

STATE BOARD OF HEALTH

AND

VITAL STATISTICS

OF THE

THE PROPERTY OF THE NEW YORK HOSPITAL. MAR 2 1892

COMMONWEALTH OF PENNSYLVANIA.

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COMMONWEALTH OF PENNSYLVANIA,
STATE BOARD OF HEALTH,
EXECUTIVE OFFICE, *December 2, 1889.*

To His Excellency JAMES A. BEAVER, *Governor:*

SIR: In compliance with the provisions of section ten of the "Act to establish a State Board of Health, for the better protection of life and health, and to prevent the spread of contagious and infectious diseases in this commonwealth," approved June 3, 1885, I have the honor to transmit the Fifth Annual Report of the Board, for the year ending December 1, 1889.

BENJAMIN LEE,
Secretary.



Resolution of the Board relative to papers published in its Annual Report, Adopted July 2, 1885.

Resolved, That no papers shall be published in the annual report of this board except such as are approved for the purposes of such publication by a majority of the members of the board and that any such paper shall be published over the signature of the writer, who shall be considered as entitled to the credit of its production, as well as responsible for the statement of facts reported and the opinions expressed therein.



PART I.

REPORT AND MINUTES.



REPORT OF THE SECRETARY.

To the Honorable, the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania.

GENTLEMEN:—It has been the custom of your Secretary in presenting his Annual Report, to address it to the President of the Board. A change which has taken place in the membership of the Board has, however, rendered that position vacant. The Secretary believes that he only expresses the cordial sentiments of the Board when he testifies to the fidelity with which the retiring President, Dr. David Engelman, discharged the duties of his office, both as a member of the Board and as its presiding officer, and the regret which is felt in severing the connection. The fact that he was at the time when the term of his appointment expired serving his third consecutive term as President is a sufficient evidence of the esteem in which he was held by his associates. He is succeeded upon the Board by the Hon. S. T. Davis, M. D. of Lancaster. This gentleman, like his predecessor, adds to his medical education and training the advantages of a considerable legislative experience which will be of use to the Board in shaping its proposed enactments for the better protection of the health of the people of the State and greater efficiency and uniformity in sanitary administration. The active and intelligent interest taken by him in advancing such legislation while a member of the House of Representatives, is a guarantee that he will bring to the duties of his new position both energy and the resources of a well stored mind, alive to the necessity for sanitary reform.

During the past year the Board has held three regular and three special meetings. The regular meetings were held Nov. 18th, 1888, May 30, 1889, and July 10th, 1889. The special meetings were held November 30th, 1888, February 27th, 1889 and September 27th, 1889. Full details of these meetings will be found in the minutes.

SANITARY LEGISLATION.

In obedience to that clause in the law creating the Board which makes it its duty "to suggest further legislative action or precaution deemed proper for the better protection of life and health," the Secretary drew up earlier in the year a number of bills which were approved by the Board at a special meeting and duly presented to the legislature. These measures were introduced in the House of Representatives and ably supported by the Hon. James Wilson Walk, M. D. of Philadelphia, while in the Senate the Hon. M. C. Watson, of Shenandoah

used his influence in their favor. It is the misfortune of legislation of this kind, that it is compelled to stand entirely on its own merits, and that public sentiment, which legislators feel themselves bound to consider, is not sufficiently advanced to appreciate those merits in many instances. There are no private or local interests to be furthered by it, and the number of those who are public spirited enough to look beyond these into the broad field of the general good is comparatively small. The member of the Legislature who champions the cause must do so with the consciousness that he is in no way contributing to his own political preferment, or increasing his popularity with his constituents. The friends of sanitary reform must therefore be content to move slowly. In accordance with the suggestion of the Board, however, an important step was taken in the establishment in each branch of the Assembly of a "Standing Committee on Public Health and Sanitation," important not simply as affording a means whereby these subjects may receive more attentive consideration at the hands of that body, but as an index of the steadily increasing recognition of the necessity for intelligent legislation for the protection of the lives and health of the people of the Commonwealth. A conference between the Board and the Senate committee on Public Health and Sanitation, left no doubt in the minds of the Board that the committee was desirous to further all such measures. It is questionable whether the large size of the corresponding committee in the House of Representatives is not a bar to the careful consideration of these subjects, and whether a smaller committee, carefully selected with a view to the special acquaintance of its individual members with such questions would not be of greater service. It is true that very important measures introduced by the Board, such as that for establishing local boards of health throughout the rural districts, for ensuring the registration of vital statistics, for preventing the pollution of streams, and protecting the sources of water supplies of towns, failed to pass. But on the other hand those which most nearly affected the present working of the Board and the passage of which indicated the confidence of the Legislature in the judicious character of that work were successful. A bill in which the Board took an active interest for the supervision and repression of the disease known as "Glanders Farcy" in horses, placing this matter under the control of the Board of Agriculture, also become a law. There is therefore every reason for the Board to look forward to the next session of the Legislature with the hope that much may be accomplished toward inaugurating a thorough system of sanitary administration throughout the Commonwealth. The Secretary is constantly in receipt of inquiries of the most urgent nature from boroughs all over the State inquiring how they shall proceed to establish boards of health. To these requests he is compelled to return the disheartening and humiliating response that no legal provision exists for the crea-

tion of these essential safeguards to the health of their communities. This subject is earnestly recommended to the consideration of the committee on sanitary legislation. Means should be at once taken to arouse popular sentiment on this important matter in order that the Legislature may feel that it will be backed up by public opinion in passing an enactment for this purpose.

FALSE CERTIFICATES OF DEATH.

At a regular meeting held May 30–31, and June 1, two physicians were arraigned before the Board on the charge of having issued false certificates of death in order to enable bodies of persons who had died of infectious diseases to be transported by rail. In one instance the body thus transported was, with good reason, suspected of having been the cause of an outbreak of scarlet fever in a town in Ohio. The attention of the Secretary was called to this outbreak, which was attended by mortality by the Secretary of the State Board of Health of that state. On careful examination of the accused, it appeared that in each case the physician was not the regular attendant, that he was called in just before the death of the patient and was in ignorance of the previous history of the case, and that he gave his certificate without intention of deceit and based on the symptoms observed at the time. The Board therefore absolved them of having *intentionally* issued false certificates of death, but admonished them never again to issue a certificate without full knowledge of the history of the case for at least six weeks previous to death. This is a crime the seriousness of which it would be difficult to over-estimate, and yet, strange to say, the statutes of Pennsylvania contain no reference whatever to the subject. The only restraint upon thus scattering broadcast the seeds of disease, is to be found in the regulations of railroad and other transportation companies, the ordinances of certain cities and the regulation of this Board.

The Secretary would suggest to the Board the expediency of referring this subject to the committee on sanitary legislation with instructions to draft a bill which shall place the matter under proper control.

PITTSBURGH SANITARY CONVENTION.

In connection with the meeting at Pittsburgh, the Board held a Sanitary Convention for the purpose assigned to it by law, of "disseminating information" upon subjects pertaining to the preservation of the public health, (in this instance particularly in large cities situated on water courses) and of exciting an interest in the public mind in the discussion of sanitary subjects generally. The annual address was delivered before this Convention by Dr. Jackson Piper, President of the State Board of Health of Maryland, on the subject of "The Sanitation of Country Towns and Farm Houses." The address was full

of interest and instruction and was listened to with deep attention. A very valuable paper was also read by Dr. Henry B. Baker, Secretary of the State Board of Health of Michigan, on a cognate topic "A Plea for Public Health Work in Villages."

Many other useful contributions to sanitary science were brought before the Convention, the greater number of them by citizens of Pittsburgh and its vicinity. Among these may be noticed a sanitary history of Pittsburgh by the former health officer, Crosby Gray, Esq., and a paper on "The Ventilation of School Buildings," by M. B. Goff, L.L. D., Chancellor of the Western University of Pennnsylvania.

Thus it will be seen that the object of inducing the leading minds of the community where the convention was held to seriously consider such subjects was attained; and while, owing to peculiar circumstances presently to be detailed, the attendance was at no time as large as had been hoped, yet the publication of abstracts of the papers in the daily press of Pittsburgh multiplied the local audience many fold, while their reproduction in full in the "Annals of Hygiene" brought them to the notice of an intelligent public, throughout the State and country. Much good was thus undoubtedly accomplished and the Secretary has no hesitation in recommending that a similar convention be held at the time of the next regular meeting of the Board. A small city where there are comparatively few distractions, would probably furnish a larger audience and create greater local interest.

THE WORK OF THE BOARD AT JOHNSTOWN.

It has been already said, however, that peculiar circumstances combined to interfere with the attendance at the Pittsburgh convention. The rain fell in torrents, and there were rumors even on the evening of the first day, of a washout on the Pennsylvania railroad, which made members from a distance anxious with regard to the possibility of delay on their return. The day following, all interest was centered on the wreckage which swept down the swollen Allegheny, and rumors became a certainty that a serious freshet with loss of life had occurred. Accounts, however, were still conflicting and unsatisfactory. The news of Sunday morning, left no room for doubt that a cataclysm of unparalelled proportions had swept the valley of the Conemaugh, demolishing the flourishing mountain city of Johnstown, and filling the river with dead bodies and carcasses. It was evident that a moment was not to be lost if the water supply of the two great cities which lie at the mouth of the Allegheny was to be preserved from contamination of the most dangerous and revolting character. It was equally clear that the conditions existing at the scene of disaster were such as to breed pestilence if the most active measures were not taken to prevent wholesale putrefaction, and to provide for the wants of the thousands of homeless survivors. Accordingly, your Secretary accompanied by Dr. George G.

Groff, who kindly volunteered his services, and for whose wise counsels and ready help during the earlier period of this great emergency the Secretary desires here to express his deep sense of obligation, took the first available train for the scene of disaster. Arriving near nightfall at the village of Nineveh, about nine miles from Johnstown, it became evident that this was the point at which work for the protection of the water supply must begin, because just here a dam and a bend in the river detained large numbers of bodies and dead animals. One hundred and sixty-two bodies were found here most of them already embalmed and waiting identification. From here telegrams were sent to the sheriffs of the counties bordering on the Conemaugh, Kiskiminetas, Allegheny and Ohio rivers, instructing them, in the name of the Board, to summon posses to patrol the rivers, tear down the drift heaps, and remove the dead bodies both of human beings and of domestic animals, adding that this was absolutely necessary to protect their counties from pestilence. At the same time messages were sent to Superintendent Pitcairn of the Pennsylvania railroad and to Adjutant General Hastings informing them of the situation at this point, and urging the importance of putting a large force of laborers with competent bosses at work at once.

A communication was also addressed to Dr. Hammer, the coroner of Westmoreland County, notifying him that the emergency was such that in the interests of public health certain formalities might be dispensed with, which would necessitate the detention of bodies after recognition.

Early the following morning, Old Nineveh on the opposite side of the river was visited. Between twenty and thirty bodies were lying here awaiting identification. Instructions were given for disinfecting the premises and embalming the bodies; and the coroner not having made his appearance a justice of the peace was empowered to impanel a jury and hold an inquest.

Arriving at Morrelsville, about a mile and a half below Johnstown, by the first morning train, General Hastings and Mr. A. J. Moxham, chairman of the local committee, were at once conferred with, and the head quarters of the Board established in the same room with those of the committee, in order to avail themselves of telegraphic, mail and messenger service, as well as to be in constant communication with the committee. The chairman of this committee, as well as Mr. J. B. Scott of Pittsburgh, who, on the fifth day of June, having been elected by the representatives of the various boroughs as director, with absolute authority, assumed the reins of power, were ready to avail themselves of the assistance of the Board in all matters of sanitary precaution and police. To the latter gentleman, especially, the secretary desires to make his acknowledgements for his constant readiness to co-operate with him in all such measures and his intelligent appreciation of the

necessities of the situation from a sanitary standpoint. The first day was devoted to a thorough inspection of Johnstown and to making the acquaintance of physicians and others who might be useful in the great work which lay before the Board. Disinfectants were ordered in considerable quantities from Pittsburgh, and the hospital which had been extemporized in a lager beer saloon under the name of the Bedford Street Hospital, was made the temporary depot for disinfectants. On the second day, the Secretary commenced the organization of a sanitary relief corps, naming Dr. W. E. Matthews of Johnstown as its chief. With this exception the corps was composed entirely of physicians and others from a distance who had come on the first intelligence of the catastrophe to render aid to the sick and wounded, and who finding their services uncalled for in this capacity, generously volunteered to perform the more laborious and dangerous duties of sanitary police officers. Through fire and flood, under drenching rains and through seas of mire, these devoted men prosecuted their arduous and often distressing labor of recovering the dead, dragging out and burning carcasses and distributing disinfectants. Among those who thus distinguished themselves may be named:

Surgeon P. M. Carrington, U. S. Marine Hospital Service.

Drs. James McGrew and Frank J. Phillips, both of Pittsburgh.

Drs. Howard Fussell and J. Allen Smith, both of Philadelphia.

Dr. White of McKeesport. All of Pennsylvania.

Dr. A. J. Graham of Peoria, Illinois, and Dr. F. W. Marvel, of Atlantic City, New Jersey.

Dr. Matthews although suffering from painful injuries sustained during the flood, which had swept away all his earthly possessions, gave himself wholly to the work of organization and supervision, which he prosecuted faithfully and judiciously during the summer.

A telegram was received on the same day from Supervising Surgeon General Hamilton of the United States Marine Hospital Service, announcing the readiness of his Bureau to render any aid in its power and the fact that he had ordered Surgeon Carrington to report to the Secretary from Pittsburgh.

In reply a request was sent for disinfectants which was promptly attended to, all that were available being sent from Washington and a large consignment from Baltimore. A letter was also sent by the Secretary to his Excellency Governor Beaver, reviewing the situation at large, and declaring the necessity for State intervention, both with men and means, in order to prevent impending disease.

Dr. R. Lowry Sibbet, Medical Inspector to the Board for the Cumberland district, reported for duty, and the day following was deputed to make an inspection of the Conemaugh valley, with a view to determining the needs, sanitary and personal, of the survivors in the different boroughs. During the week that he remained, he accomplished im-

portant work in this field. The Woodvale Chemical Works were fortunately out of the reach of the flood, and the proprietors generously furnished the Secretary *carte blanche* for all the copperas that might be needed. One of the sanitary corps was despatched thither with a wagon, reaching the place at great personal risk, owing to the washed condition of the road, and a new place was selected for the storage of this and other disinfectants, on the track of the Baltimore and Ohio Railroad, which was now sufficiently free from débris to allow trains to come into the city. On the third day the force was greatly strengthened by the arrival of Superintendent of Health Baker from Pittsburgh with a large squad of uniformed sanitary police, and also of a similar body from Allegheny, detailed by Mr. James Bradley the health officer of that city. Dr. Carrington having also reported, was placed in charge of a portion of this force, with instructions to disinfect all dead bodies and carcasses which could not be extricated from the wreckage.

The remainder under Dr. Fussel were detailed to extricate and burn dead animals. Being entirely without implements or vessels for dissolving and applying disinfectants, the Secretary accompanied Dr. Carrington and his force on a search of stores on the only remaining business block of the place, clambering over drift and wreckage on a level with the tops of third story windows in order to reach them, and succeeded in obtaining a few damaged buckets, coffee pots, and watering pots, with which they made shift to do the work until more could be ordered from Pittsburgh.

On the fourth day the places of these men were to some extent filled by ordinary laborers, and the former were set to work to make a house-to-house inspection of all the inhabited houses, with a view to ascertaining their condition, abating house and yard nuisances, and instructing the people in the use of disinfectants, which were freely provided.

In the meantime, an immense compact mass of drift, covering many acres, from thirty to fifty feet in depth, in which were entangled and buried large numbers of bodies and carcasses, encumbered the river for a distance of half a mile above the stone bridge.

The laborers of the Pittsburgh Relief Commission were fully occupied in exhuming the town. Every day was adding to the dangers of contamination of the water supply of the cities below. A cautionary proclamation had already been forwarded to the Pittsburgh papers, stating the risk and advising all persons to boil the water before drinking it. Johnstown itself was fortunately supplied with pure water from reservoirs in the mountains, a fact which contributed much to the preservation of the health of the inhabitants and of the large numbers of strangers present. Careful supervision of these sources was maintained during the summer, frequent visits to the reservoirs and water sheds feeding them having been made by Drs. Carrington, Probst and Sibbet, and by the Secretary accompanied by Deputy Medical Inspector Wagoner, and Mr. James McMillen, the president of the water company.

A careful inspection of the enormous mass above the bridge made from both sides by traversing its surface, convinced the Secretary that its proposed destruction by fire would be impossible even were it desirable, and that forces almost Titanic would be needed for its disruption.

Leaving Dr. Groff in charge of the work in Johnstown he therefore, on the afternoon of the fourth day, proceeded to Pittsburgh. He now had an opportunity for the first time of obtaining some definite information as to the injuries wrought by the floods in other parts of the State. Based upon this intelligence, a telegram was sent the same night to seven Medical Inspectors of Districts bordering on the Susquehanna and Juniata rivers, instructing them at once to make personal inspection of all the flooded regions in their respective districts, and to employ forces to reclaim bodies and burn carcasses.

The day following, a temporary Executive Office of the Board was established in the chamber of commerce with the kind assistance of Dr. J. Guy McCandless, Registrar of Vital Statistics of the City of Pittsburgh. Two gangs of wreckers of ten men each, with bosses, were commissioned to proceed from the mouth of the Kiskiminitas to Johnstown, carefully searching for dead bodies, and dragging apart or burning all suspicious drift piles. Feeling extremely solicitous in regard to the drift at the stone bridge, the Secretary waited upon the Executive committee of the Pittsburgh Relief Committee, and endeavoured to obtain from that body a promise to undertake its removal. Failing in this he visited Superintendent Pitcairn and Mr. McCrae of the Pennsylvania Railroad Company on the same errand but could obtain no further concession than a promise to transport laborers with all possible expedition. A telegram was then despatched to his Excellency Governor Beaver, stating that four thousand men ought to be put to work on this drift at once, and that money was needed for immediate necessities. A written report of the inspection of the Conemaugh valley was also sent him, setting forth the dangers of the situation, declaring the condition a nuisance prejudicial to the public health, and calling upon him, in view of the entire inability of the local authorities to meet the emergency, to furnish at once a sufficient force to remove and abate the same.

To this declaration his Excellency replied immediately by wire authorizing the Secretary to borrow money for immediate necessities, and, three days later, in person, reaching Johnstown early on Sunday morning June 9th. After a careful survey of the situation, he decided to furnish men and means to remove the wreckage and filth to such an extent as the Board might deem necessary to prevent the occurrence of pestilential disease.

The Allegheny river had already been patrolled by a steamboat under the direction of Dr. Alex. Æ. McCandless, the sheriff of Allegheny county in accordance with the instructions of the Board; and a second

boat had been commissioned for a trip of the same kind. Fearing that the Ohio river might become polluted and thus render the water supplies of towns below in this State and in the States of Ohio and West Virginia unhealthful, the Secretary on the 8th of June commissioned Captain Rogers of the steamer "Tide" to patrol the Ohio on both sides down as far as the State line in a similar manner.

Dr. C. O. Probst, Secretary of the State Board of Health of Ohio, having come to Pittsburgh in response to a request of the Secretary, united with him in messages to the boards of health of cities on that river beyond the Pennsylvania state line suggesting the importance, for a time, of universal precautions and vigilant search for dead bodies and carcasses. Leaving the Pittsburgh office in charge of Medical Inspector J. R. Thompson, of the Allegheny district, the Secretary left for Johnstown the same day, and was fortunate in meeting at Rockford intersection Surgeon General Hamilton who was returning from Johnstown. The experience of this officer in the organization of sanitary relief work in Florida enabled him to make valuable suggestions with reference to the difficulties the Board had to contend with in Johnstown, which it is desired here gratefully to acknowledge.

Detained at Somerset on Sunday morning, he telegraphed instructions to the sheriffs of all the counties bordering on the West Branch of the Susquehanna and the Juniata rivers, to co-operate with the medical inspectors in the work of reclaiming the dead and burning carcasses and drift piles.

Under Dr. Groff's energetic and judicious management the organization of a permanent sanitary corps of the State Board of Health, composed of resident physicians to take the place of the volunteer sanitary relief corps, the members of which were naturally anxious to return to their homes which they had left on the generous impulse of the moment, was found to be progressing rapidly. The following was the final arrangement of the work. The entire region from South Fork to Nineveh was now divided into twelve districts. Over each of these was placed a deputy medical inspector, whose duty was to make house-to-house inspections, examining carefully the condition of houses, cellars, yards and privies, encouraging and advising the occupants as to the best means of preventing disease, instructing them in the use of disinfectants, and noting any cases of sickness, and to report the results of their observations at the close of each day to Dr. W. E. Matthews, chief deputy medical inspector. On the basis of these reports the work for the day following was mapped out by that officer in consultation with the executive officer of the Board. During the period in which the region below the stone bridge was practically cut off from communication with the central office, Dr. Spencer M. Free, medical inspector of the Western Slope district, was placed in charge of a temporary office in Cambria City.

A depot for disinfectants was established in connection with each district office, and from this, numerous supply stations were kept provided, each in charge of an employé who was competent to instruct the people in their use.

In the district of Kernville alone, there were fifteen such sub-stations. Large quantities were thus taken away by the people themselves and still larger quantities distributed in wagons in the course of inspections. Besides the disinfectants ordered by the Board, immense qauntiites were contributed by various manufacturers of chemicals. The most note-worthy donation of this kind was sent by Quibell Brothers of Newark, England, its value being stated at £500.

A printed form for the daily report was furnished not only to the inspectors, but to the hospitals, and to all practicing physicians. In this way the Board was constantly in possession of perfectly accurate information as to the existence of contagious or infectious diseases and was in a position to promptly contradict the sensational stories of the newspapers which were calculated to excite so wide-spread a feeling of dread and distrust. This was done by bulletins frequently issued and widely distributed. To separate details were assigned the work of garbage collection and cremation; of disinfection of houses and cellars, of streets and open spaces and of the dump and river banks; of dragging out and burning dead animals; of erecting and caring for public privies; and of collecting and destroying flood-polluted bedding, clothing and carpets. This latter was a troublesome task because of the fact that in many cases these articles had been fished out of the flood with a view of saving them. Some idea of its magnitude may be formed when it is said that in one district alone, twelve wagon loads of such material were burned daily. To facilitate this process as well as the cremation of animals, rosin and tar were freely and successfully employed, large donations of these valuable articles having been received from generous citizens of Wilmington, N. C.

The entire force of the Sanitary Corps when it was doing its largest amount of work, including inspectors, clerks, messengers, laborers and cooks, was two hundred and eighty-five men. In consequence of the filthy habits of the great body of laborers, it was also found advisable to appoint an inspector of camps. Blanks were devised by Dr. Groff for making a sanitary survey, which gave the Board a knowledge of the condition, size, environment, occupancy and health, present and past, of every house in the valley. The Secretary advises a general distribution of these blanks to boards of health throughout the state as guides for this important work, in their own communities.

In accordance with his expressed resolution, immediately after his departure, the Governor commissioned Adjutant General D. H. Hastings to take charge of the work of the renovation of Johnstown, under the supervision of the Board. That able and energetic officer reported

to the Secretary for duty on Thursday, June 11th, with Col. H. T. Douglass as chief engineer. Frequent inspections were made of the entire territory in company with these officers to determine in what manner the work could be most efficiently and economically prosecuted; the aim being kept constantly in view to authorize no measure, which could not be justified on strictly sanitary grounds. The relations of the Secretary to these officers were of the most friendly nature, and he takes pleasure in acknowledging the uniform courtesy extended to him by them and their readiness to comply with his every suggestion.

Although the forces now at work were smaller than those employed by the Pitsburgh citizens' relief committee, the work was so much more thoroughly systematized that it was equally effective. Thoroughfares were rapidly opened up; dynamite was used with great effect in rending apart the solid drift at the stone bridge; and members of the sanitary corps were constantly on hand to keep down the stench from decomposing bodies which would otherwise have driven the laborers from their posts.

His Excellency, the Governor, from time to time visited Johnstown and inspected the progress of the operations. Excellent order was maintained by the presence of the Fourteenth Regiment National Guard of Pennsylvania who performed this irksome and sometimes arduous duty with praiseworthy cheerfulness and marked discretion. In this connection it may be said that Johnstown and all who were working there, owe a debt of gratitude to His Honor Judge Johnson, for having assumed the responsibility of granting an injunction restraining the liquor saloons from opening for an entire month. The Secretary endeavoured to obtain a renewal of this injunction and his Honor went so far as to intimate that if the consent of all the councils of the different boroughs were given, he would grant it. An effort was made to obtain this assent, but unsuccessfully.

On the eighth day of July a very considerable reduction of the force of laborers took place. General Hastings' duties in connection with the National Guard took him elsewhere, and Captain Geo. C. Hamilton, a member of his staff, assumed control as chief engineer-in-charge. Like his predecessor, his energies and skill were cheerfully and freely placed at the disposal of the Board and his personal relations to the Secretary left nothing to be desired. A state which can at a moment's notice, place in the field such a body of citizen soldiery, officers and men, line and staff, of such varied acquirements, ready to meet emergencies of so unusual a nature, is certainly to be congratulated.

The medical officers of the guard who were present, Dr. J. E. Silliman of the general staff, and Dr. Foster, surgeon of the Fourteeenth regiment, rendered valuable aid in the inspection of morgues, hospitals and camps. Surgeon General Read also visited Johnstown and made valuable suggestions as to the hygiene of the laborer's camps.

As soon as temporary houses began to be furnished by the Pittsburgh citizens relief committee, and by the Flood Relief Commission, the question arose "Where will it be safe from a sanitary standpoint, to place dwellings?" At first it was deemed expedient to forbid the locating of a home in any region where there were still large deposits of flood filth and probably many human bodies. This placed almost the whole of Johnstown proper and a great part of Kernville under the ban. From week to week the limits were drawn in, but it was not until late in the month of August, that the proscription was entirely removed. This, together with the fact that much uncertainty was felt as to the final adjustment of the grade of the city, and the dredging of the rivers, led observers who were not familiar with these circumstances to criticize somewhat unfavorably the apparent tardiness of the people in rebuilding.

On the 10th day of July a regular meeting of the Board was held at Johnstown, the work done under the auspices of the Board reviewed, and the ground carefully inspected. As a result of this inspection, a resolution was passed sanctioning all that had been done and authorizing the further prosecution of the work. Toward the end of the month however, the Governor finding that the money which he had assumed the heavy responsibility of borrowing was nearly exhausted, consulted the Secretary with regard to the propriety of bringing operations to a close. The result of the conference was the determination on the part of his Excellency to obtain an additional loan, which would enable the work to go on for several weeks longer. A considerable portion of this labor consisted in the excavation of filthy cellars, and clearing the river of wreckage which obstructed the escape of the sewage of the city. On the 27th of September a special meeting of the Board was held at Johnstown, at which it was decided that operations might safely cease on the part of the State; but as this action was received with deep regret by the people, it was decided, after consultation with the Governor, to allow the special work of promoting the escape of the sewage and drainage of the town, through the choked river to continue for a few days longer, and the declaration that the nuisance was abated was not issued until October 12th.

The essential service rendered by the corps of United States Engineers under Captains Bergland and Sayers, and subsequently under Lieut. Mason M. Patrick, in first laying pontoons and afterward building more substantial bridges across the rivers must not be forgotten. These means of communication were of the utmost importance as affording an opportunity for the removal of filth and wreckage.

During the entire occupancy of the Board, notwithstanding the unusual exposure to which children were subjected, not more than three cases of diptheria were reported, two of which originated before the flood, and there was no spread of the disease. In August typhoid

fever, introduced from the country, prevailed to a moderate extent, usually in a mild form. The Board has reason, therefore to congratulate itself that its labors were not unfruitful.

THE WORK OF THE BOARD IN OTHER FLOODED REGIONS.

In the meantime the condition of the other flooded regions of the State had not been overlooked.

By the 14th of June reports had been received from all the inspectors to whom instructions had been wired on the 6th. Based upon these reports a declaration of nuisance was made for all the flooded towns on the Juniata and the West Branch of the Susquehanna, and forwarded to the Governor. At the meeting of July 10th, a special committee was appointed to visit these places. This committee accomplished the work, and reported through its chairman Dr. Groff. In accordance with its recommendations, his Excellency the Governor furnished considerable pecuniary relief, and the Secretary forwarded disinfectants and circulars of information appropriate to the emergency to a large number of towns. The report of this committee is now awaited to declare the nuisance in these districts also abated.

SUPERVISION OF WATER SUPPLIES.

The necessity of legal supervision of the water supplies of towns such as was proposed in a very mild way by a bill introduced at the last session of the Legislature by the Board, has been clearly emphasized during the past year,

First, In the occurrence of an epidemic of typhoid fever in Wilkes-Barre, during which there were about six hundred and fifty cases and sixty deaths, the cases occurring almost exclusively among those who used the water from one reservoir, while those who drank that supplied from other sources generally escaped. A careful investigation of this epidemic and of the sources of water supply was made by Medical Inspector Taylor, and subsequently by the Secretary, who visited the city for that purpose in the month of August.

Secondly, In the protest of a number of influential citizens of Muncy against the proposed introduction of water into that town from a source which could not fail to be contaminated, an investigation of which was made by Dr. G. G. Groff, and,

Thirdly, in a suit, in which the Secretary was a witness, between the Borough of Towanda and the Towanda water company. The water supply of this company is from a source almost exactly like that now proposed for Muncy. The water has been from the first so foul and offensive that the citizens do not dare to drink it. It has been the subject of constant litigation and untold annoyance.

The facts brought out in the recent trial at Tunkhannock throw valuable light on the way in which many of the towns in this State are sup-

plied. A company is formed outside of the State, generally in New England. Two or three citizens of the town are made corporators and their names put down on the books as holding one share of stock each. Water is brought from the nearest possible source—not the purest, but that which will cost the company the least. The cheapest possible materials are used in the construction of the works, often materials which have been condemned elsewhere, a course strainer is substituted for a proper filter bed, if indeed any attempt is made at filtration. But the owners of the works, hundreds of miles away are not compelled to drink the water, and so long as they pocket their ten per cent dividends, what difference does it make to them that a little country town in the wilds of the Alleghenies is decimated by typhoid fever or Dysentery?

The Secretary also had occasion to make a personal investigation into an outbreak of dysentery in the State Hospital for the Insane at Danville. Analyses of the water indicated that in some way, impurities had found their way into it possibly from the canal under the bed of which the pipe ran. Dr. Schultz, superintendent of the asylum, had already introduced admirable appliances for boiling the water on a large scale and the good results of this precaution were immediately manifest.

EPIDEMICS.

During the past year the occurrence of infectious and contagious diseases in the following districts has been reported to the Board, and successful action taken thereon to prevent their spread, viz:

Typhoid fever at McAllisterville S. O. School, Juniata county.
Typhoid fever at Eldred, McKean county.
Typhoid fever at Wilkes Barre, Luzerne county.
Typhoid fever at Middletown, Dauphin county.
Typhoid fever at Duncannon, Perry county.
Typhoid fever at Coalville, Cambria county.
Typhoid fever at Nanticoke, Luzerne county.
Typhoid fever at Trout Run, Lycoming county.
Typhoid fever at Confluence, Somerset county.
Typhoid fever at Dry Run, Franklin county.
Typhoid fever at Instanter.
Typhoid fever at Shankesville, Somerset county.
Typhoid fever at Tyrone, Blair county.
Typhoid fever at Weissport, Carbon county.
Typhoid fever at Orbisonia, Huntingdon county.
Typhoid fever at Butler, Butler county.
Diphtheria at New Bethlehem, Clarion county.
Diphtheria at Antrim, Tioga county.
Diphtheria in Lehigh county.

Diphtheria at St. Petersburg, Clarion county.
Diphtheria at Gallitzin, Cambria county.
Diphtheria (second outbreak) at Gallitzin, Cambria county.
Diphtheria at Fleetville, Lackawanna county.
Diphtheria near Pottsgrove Reservoir, Altoona, Blair county.
Diphtheria at Carbondale, Lackawanna county.
Small-pox at Cameron Chute, Cameron county.
Small-pox at Lebanon, Lebanon county.
Small-pox at Nanticoke, Luzerne county.
Small-pox at Kingston, Luzerne county.
Small-pox at Wilkes-Barre, Luzerne county.
Small-pox at Pittsburg, Allegheny county.
Dysentery at Danville, Montour county.

Three epidemics of diphtheria have called for the intervention of the Board during the past year. One in Lehigh county involving a number of towns, one in Gallitzin, Cambria county, and one in Carbondale. In each case the Board felt called upon to declare the existence of an epidemic and to issue stringent regulations, especially prohibiting public funerals and unnecessary visiting in infected houses. Every case of small-pox which has occurred has been promptly reported to the Board, except in the instance of Nanticoke, where the borough authorities were extremely negligent and allowed an epidemic of considerable proportions to take place. In all other cases the disease has been checked at once.

An encouraging sign is the increasing readiness of authorities and people throughout the State to notify the Board of such outbreaks and obtain its advice as to their repression. This fact, however, only brings into clearer relief the absence of any proper sanitary organization recognized and enforced by the law, which would enable them to meet such emergencies themselves.

CORRESPONDENCE, DISTRIBUTION OF CIRCULARS AND REPORTS.

The total number of written communications sent during the year was 1910.

The total number of written communications received during the year was 1713.

The total number of health circulars distributed by the Board during the year was 12,782: of this number 3470 were distributed at Johnstown, and the immediate neighborhood in connection with the flood of May 31st.

The total number of leaflets and bulletins issued in the flooded regions was 50,000.

The total number of Annual Reports distributed by the Board for the same period was 1,251, and of Compendiums of the Law relating to Public Health and Safety in Pennsylvania 1,082.

ADDITIONS TO LIBRARY.

Total number of Pamphlets received during the year was 131.

Total number of books (reports and other works) received during the year was 116.

Total number of books obtained by requisition was 9.

INTER-STATE NOTIFICATION OF CONTAGIOUS DISEASES.

Notification of the existence of contagious diseases has been given to and received from the Secretaries of other State and Provinces as follows:—

Small-pox.

Notification sent to all other State Boards on seven occasions, covering five separate outbreaks.

Notification received from Illinois on two occasions, covering two outbreaks.

Iowa, on two occasions covering two outbreaks.

Indiana, on one occasion, covering one outbreak.

Massachusetts, on one occasion, covering one outbreak.

Michigan, on three occasions, covering four outbreaks.

Minnesota, on three occasions, covering two outbreaks.

Ohio, on four occasions, covering six outbreaks.

Ontario, on three occasions, covering two outbreaks.

Maine, on one occasion, covering one outbreak.

New York, on one occasion, covering three outbreaks.

Quebec, on one occasion, covering one outbreak.

Tennessee, on one occasion, covering one outbreak.

Wisconsin, on one occasion, covering one outbreak.

Diphtheria.

Notification sent to all other States on one occasion, covering five outbreaks.

Yellow Fever.

Notification received from Louisiana, on one occasion, covering one case.

Respectfully submitted,

BENJAMIN LEE, M. D.,

Secretary and Executive Officer.

MINUTES OF THE BOARD.

SPECIAL MEETING, *November 30th*, 1888.

A special meeting of the Board was held Friday, November 30th, at the Executive Office, Philadelphia, the President, Dr. Engelman in the chair.

Bills to the amount of $165.92, including vouchers No. 246 to No. 252, were presented by the Secretary, having been duly audited and approved by the Executive Committee. On motion they were approved and ordered to be paid, and the Board then adjourned.

BENJ. LEE, *Sec'y.*

SPECIAL MEETING, *February 27th*, 1889.

A special meeting of the Board was held, on the call of the President, at the Supreme Court Room, Harrisburg, at 10 A. M. Wednesday, February 27th, 1889, Dr. Engelman presiding.

There were present Drs. Engelman, Dudley, Groff, McClelland, Lee, and Mr. Murphy.

The Secretary presented bills, representing vouchers No. 253 to No. 266, and amounting to $818.27, which had been audited by the Executive Committee. They were on motion approved.

The Secretary stated that Dr. Edwards had called at the Executive Office and explained that it would be out of his power to attend.

Attention was then called to the following bills which had been prepared with a view to their introduction into the present legislature.

First:—"An Act to repeal certain clauses of an Act entitled an Act to establish a State Board of Health for the better protection of life and health, and to prevent the spread of contagious and infectious diseases in this commonwealth." The clauses referred to are those limiting the expenditures of the Board, and which make any increase of appropriation impossible as long as they remain in the statute book.

The bill was approved for presentation to the legislature.

Second:—"An Act to provide for the current expenses of the State Board of Health and Vital Statistics for the year commencing on the first day of June, Anno Domini one thousand eight hundred and ninety." This bill asked for an appropriation of $15,200, for the two years, of which $5000, should be devoted to sanitary inspections, chemical analyses, etc.

On motion it was amended increasing the latter item to $8000, and the aggregate to $18,200, and as amended was approved.

Third:—"An Act to enable the State Board of Health and Vital Statistics to discharge certain duties assigned to it by law." This bill provided penalties for violation or neglect of the orders of the Board authorized by the president and secretary to administer oaths, made the expenses of the removal of a nuisance a lien on the property, and authorized the appointment of two additional clerks for registration purposes in the department of Internal Affairs, and made prothonotaries and clerks of orphans' courts, registration officers of the Board to be compensated by the county commissioners.

It was approved as read.

Fourth:—"An Act to promote the purity of water-supplies of cities, towns, boroughs and villages," calling for the filing of plans and surveys of all new water-works, with the Secretary of the Board. It was amended in such a way as to provide for the extension of distribution and for ordinary repairs, without such formality, and as amended was approved.

Fifth:—"An Act to prevent the deposit of carcasses of animals or other noxious matter in certain waters in this State, or upon the surface of any road, street, alley, vacant lot, public ground, market space or common, and providing for the abatement of the nuisance occasioned by such deposit, and the punishment for violations of this act."

Certain explanatory and verbal amendments were proposed and passed, and the bill as amended was then approved. The Board then, on motion, adjourned to meet again in the same place at 3.30 P. M.

Pursuant to adjournment the Board reconvened at 3.30 P. M. The subject of sanitary organization of the State was then introduced and discussed. Pending the discussion the Secretary announced that a communication had been received from the Hon. W. McKnight Williamson, chairman of the Senate Committee on Public Health and Sanitation, appointing the hour of four P. M. for a conference of the Board with that Committee. A recess was accordingly taken for that purpose, and the various needs of the Board were laid before the Committee, each member of the Board presenting some special point. The reception of the Board by the Committee was extremely courteous, and their remarks were listened to with attention.

The Board being again called to order, four plans for sanitary organization of the State were laid before it.

First:—That of township boards of health reporting directly to the State Board, the plan pursued in New England, New York, New Jersey, and the Western States.

Secondly:—That of county boards of health composed of health officers in each township.

Thirdly:—That of county officers of health with deputies in each township.

Fourthly:—That of constituting the coroner of each county a health officer, and the constabulary of the townships, deputies.

After thorough discussion, in which it became apparent that the third plan, that of the county health officer, with deputies, met with the most favor, the committee on legislation was instructed to prepare a bill embodying that system, and to present it to the legislature at the earliest possible moment.

The Secretary then offered the following resolution which was adopted.

Resolved:—That the State Board of Health regards the investigations carried on at the hospital of the veterinary department of the University of Pennsylvania, as of much importance, in view of their ultimate beneficial effect upon the public health by increasing our now very limited knowledge, first:—of the contagious diseases of domestic animals and their relation to the same class of diseases in human beings; and, secondly:—of the effects of diseases of domestic animals on their own flesh and secretions, considered as a food supply.

The President presented a communication, which was read by the Secretary, from Dr. M. S. Seip, of Easton, requesting the Board to endeavor to procure legislation forbidding undertakers to embalm a body before receiving a certificate of the cause of death, from a physician.

It was referred to the Committee on Sanitary Legislation.

Dr. McClelland, Chairman of the Committee on the Sanitary Convention to be held in Pittsburgh, May next, reported progress.

On motion the time of the next regular meeting of the Board was fixed for Wednesday, May 29th, at 10 A. M., in the city of Pittsburgh, and the time for holding the Sanitary convention for Thursday and Friday, May 30th and 31st.

The Chairman of the Committee on Sanitary Convention was, on motion, authorized to take the preliminary steps, and to incur an expense not exceeding $300.

On motion the Board then adjourned, to meet as aforesaid.

BENJ. LEE,
Secretary.

Twelfth Regular Meeting.

The twelfth regular meeting of the Board was held at the Hotel Anderson, Pittsburgh, Pennsylvania, May 30th, 1889, at 11 A. M.

The following members were present during the session, viz:

Members in attendance

Dr. David Engelman, President, in the chair.
Dr. J. H. McClelland, Dr. G. G. Groff,
Dr. Pemberton Dudley, Dr. J. F. Edwards,
Howard Murphy, C. E.,
Dr. Benj. Lee, Secretary.

Confirmation of minutes

The Minutes of last regular meeting held at Harrisburg, November 18th, 1888, were read and approved; the minutes of special meetings held at Philadelphia, November 30th, 1888, and at Harrisburg, February 27th, 1889, were also read and approved.

The Secretary presented his report, which included the following items:—

Typhoid fever in McAllisterville school.

1. Epidemic of typhoid fever in the McAllisterville Soldiers' Orphan School, including letters from the principal and from Sanitary Inspector Siblet, the latter showing that the air of the neighborhood had been contaminated by the removal of privy contents, and that there was also reason to suspect pollution of the water supply from the kitchen drain.

The report recommended that the soil around the wells for a depth of two feet, and a radius of ten feet be replaced by impervious clay, and surface drainage diverted therefrom. Also isolation of the sick, and disinfection of the hospital. These were ordered by the executive officer of the Board. The total number of cases was 42, of which 2 were fatal.

The report was accepted and the Secretary's action approved.

Diphtheria at New Bethlehem

2. Diphtheria at New Bethlehem. Report of Sanitary Inspector Free. Dr. Free had recommended the taking of all needful precautions and had suggested the formation of a local board of health, taking the State Board of Health's model ordinance as its basis, and his advice was noted upon by the borough council.

Diphtheria in Lehigh county.

3. Diphtheria in Lehigh county. Sanitary Inspector McIntire's report, showing that numerous families were infected throughout the county, was read. At Emaus there were 70 cases and 11 deaths. No precautions were adopted by the local authorities.

At Macungie 17 cases were reported and 4 deaths.

At Wilford 4 cases were reported and 1 death.

At Alburtis 48 cases were reported and 11 deaths.

At Breinigsville in one family 6 cases and 3 deaths, in another 4 cases and one death: total 154 cases and 31 deaths.

The Secretary read the letter he had addressed to the chief burgess of Emaus, declaring the disease epidemic, and suggesting measures for its suppression.

The report was accepted and action approved.

Small-pox at Cameron Chute.

4. Small-pox at Cameron Chute, near Emporium. report of Sanitary Inspector Dr. Spencer M. Free. He had established quarantine, had vaccinated the people of the infected district and succeeded in stamping out the disease and preventing its spreading to other localities.

Small-pox at Nanticoke.

5. Small-pox at Nanticoke. Reports of Sanitary Inspector Taylor, and of the secretary of the borough council were read. Dr. Taylor reported the Sanitary committee to be without funds. From a report of Dr. T. L. Holley it appeared that 1005 persons had been vaccinated. There were nine cases of the disease in one family, that of the Rev. E. R. Hughes, the entire family who had refused to be vaccinated: this was on May 20, 1889. All the other cases have been released from quarantine, which had been rigorously enforced, the majority of the cases having been isolated in special hospitals.

Inspector Taylor reports the origin of the outbreak to have been in three families of Poles who reached Nanticoke December 6, 1888, via steamship "Rugia," which reached New York December 2, 1888. Twelve days later a boy in one of these families was attacked with the disease, from whom the epidemic spread. This was at once reported to the health officer at New York, by the Secretary of the State Board; since the outbreak of the disease the latter has been in daily communication with the health authorities of Nanticoke.

The report of the Secretary was adopted and his action approved.

Sanitary condition of Troy.

Sanitary condition of Troy, Bradford county. Report of Medical Inspector E. D. Payne. The Secretary reported the pollution of a stream running through the town, the source of the pollution being a tannery draining into this stream. He had recommended the authorities of Troy to construct a sewer through the town to prevent this nuisance.

The Secretary's action was approved.

Vaccination of school children at South Bethlehem.

7. Vaccination of school children at South Bethlehem. After the reading of a report of Superintendent Wett, 124 of the school children of South Bethlehem were ordered to be re-vaccinated by the local board.

Report accepted.

Diphtheria at Antrim.

8. Diphtheria at Antrim. From a report of special Inspector Drake, it appeared that that officer had quarantined the family in which the disease had broken out and had had them suitably provided for, thereby preventing a spread of the threatened epidemic.

The action of Inspector Drake was approved and the report accepted.

Adjournment.

The Board then, on motion, adjourned till 2.30 P. M.

SECOND SESSION.

The Board reconvened at 2.30 P. M., when the Secretary's report was proceeded with.

Pollution of the water at Berwick.

9. Pollution of ice supply at Berwick, Columbia county. A communication had been received from the Jackson Manufacturing Company with regard to a pollution of the ice supply taken from a pond at Berwick, Columbia county. Sanitary Inspector Leiser was directed to make an inspection and to obtain samples of water from the two ponds and from the melted ice therefrom and report thereon. These specimens were sent to Dr. Charles Crossfield, of Philadelphia, for analysis, who reported that while one was pure, the other was unfit for consumption and dangerous to health. This report was at once sent to the company, with instructions from the Secretary to forbid the use of ice from this pond.

The action of the Secretary was approved.

Nuisance from tannery at Chester.

10. Offensive tannery at Chester, Delaware county. A report was read complaining of pollution of the air at Chester by a tannery. Sanitary Inspector Atkinson was instructed to investigate same, and found it a nuisance. Chief of police Newsome subsequently reported the nuisance had been removed and the nuisance abated.

False certificate of death in case of scarlet fever.

11. False certificate of death in a case of scarlet fever. The Secretary read a communication from Dr. C. O. Probst, Secretary of the Ohio State Board of Health, stating that Dr. S. C. Campbell, of Lorain, having given a false certificate of death in a case of scarlet fever, 13 miles from [illegible] was arrested and [illegible] Probst's letter, Dr. Campbell, on the presentation of the permit of the corpse to

that place, Dr. Campbell had given a certificate to the effect that death was due to inflamation of the lungs. Sanitary inspector Thompsonwas directed to investigate the matter. This report was read and the Secretary awaited the board's instructions. On motion of Dr. Pemberton Dudley, it was resolved that Dr. Campbell be instructed to appear before the Board to-morrow to answer the charge, and that action on his case, until he has had a hearing be postponed.

Typhoid fever at Eldred, McKean county.

12. Typhoid fever at Eldred, McKean county. Sanitary Inspector Spencer M. Free reported that 15 cases of typhoid fever had occurred at Eldred, McKean county, all of which had been traced to using water from one well, the pollution of which he distinctly demonstrated. The Secretary had instructed the authorities to fill this well up. In consequence of Dr. Free's visit and interview with the authorities they had decided to adopt the model ordinance.

The action of Secretary and Inspector were approved and report accepted.

Small-pox at Lebanon.

13. Small-pox in Lebanon township. A report having been received to the effect that small-pox existed in Lebanon township, Sanitary Inspector Taylor was instructed to investigate the same. He reported that the disease had occurred in two members of one family, none of whom had been vaccinated. Quarantine and vaccination were enforced and at the last report no epidemic was apprehended. The father had been allowed to return to his occupation.

The Inspector's action was approved.

Small-pox at Kingston.

14. Small-pox at Kingston. A case of small-pox having been reported at Kingston, Luzerne county, Sanitary Inspector Taylor was sent to verify the diagnosis, which he certified as correct. Stringent precautions were adopted by the Board in concert with the authorities, and no further outbreak occurred.

Shooley Shaft nuisance.

15. Abatement of the Schooley shaft nuisance. With reference to the nuisance at the Schooley shaft from mine drainage, Sanitary Inspector Taylor wrote the Secretary on April 5, that this nuisance had been abated and the maintainer thereof was deceased.

Diphtheria at St. Petersburg.

16. Diphtheria at St. Petersburg. An alarming outbreak of diphtheria occurred in March at St. Petersburg. The borough authorities took prompt action, adopting a stringent ordinance and printing and post-

ing instructions how to prevent the spread of the disease, which resulted in the epidemic being soon brought under control. Resolved that the authorities be commended for their intelligent action and that the ordinance be published in the report of the board.

Disposition of hospital rags and bandages.

17. Disposition of rags and bandages in hospitals, &c. In consequence of the board of health of Philadelphia having addressed a communication to the State Board stating that hospital rags and bandages after use found their way to rag dealers, the Secretary addressed inquiries to 125 institutions in Pennsylvania on this subject. Of the 48 replies received up to the present time 33 state that they burn their rags; 3 disinfect, and 12 wash them before selling.

The Secretary's action was approved and report accepted.

Railroad hygiene.

18. Railroad Hygiene. The Secretary submitted a circular issued by the Pennsylvania railroad company with respect to cleanliness and disinfection on the company's property and line, requesting approval and any suggestions from the Board with authority to use name of Board in promulgating it. The Secretary had replied making suggestions, which were read. The circular was approved and necessary authority given.

Transportation of dead bodies without permits.

19. Transportation of dead bodies. A complaint was received from one of the railroad company's Superintendents that dead bodies were removed without proper permits. The Secretary had replied and pointed out the great difficulty experienced in getting transit permits in all cases into use, owing to the absence of any system of local sanitary government in the State.

The Secretary's action was approved.

General baggage agents' suggestions with regard to transportation of dead bodies permits.

20. Circulars of general baggage agents in regard to transportation of dead bodies. A petition signed by the general baggage agents of several leading railroad companies, submitting form of transit permit and asking for its adoption, was presented. The Association pointed out the importance and necessity of uniformity in this matter. The Secretary had submitted State Board form of permit, asking if it required any alteration, to which the Association had replied that it was so admirably conceived that very little alteration appeared necessary in it. The Secretary pointed out certain matters in permit with regard to disinfection, etc., which he recommended. On motion of Dr. McClelland, it was re-

solved that rules 2 and 3 with regard to transportation of dead bodies be so amended that they shall correspond with rules 1 and 2 of the general baggage agents'associaiton adopted at San Francisco, January 16, 1889, and that the Secretary be instructed to inform the Association of this action of the board.

Fraudulent use of Board's name and seal of the state.

21. Fraudulent use of the name of the Board for advertising purposes. The Secretary reported a flagrant use of State Board of Health's name and seal of the State by a company advertising cotton seed oil. He had reported the matter to the Attorney General, who had advised the Secretary that there is no law specifically punishing such a case and suggested submitting the question of taking action thereon to the District Attorney, pending the investigation and advice of this gentleman the Board resolved that the Secretary's action be approved and the matter postponed.

Diphtheria at Gallitzin.

22. Diphtheria at Gallitzin. A report of an outbreak of diphtheria at Gallitzin had been received from Sanitary Inspector C. B. Dudley. That officer had, in conformity with instructions from the Secretary investigated the same and found there had been a large number of deaths at this place. He further reported the town to be without any water supply and without any system of sewerage, not one foot of sewer being laid in the place, and complete apathy on the part of the residents. He attributed the epidemic entirely to the filthy conditions in which the people lived. He had furnished documents to the council and recommended dissemination of circulars with a view of impressing the people with the importance of cleanliness.

The action was approved.

Chair of forestry University of Pennsylvania.

23. Petition for the establishment of a chair of forestry in the University of Pennsylvania. A communication having been received asking the State Board to endorse a petition for establishing a chair of forestry in the University of Pennsylvania, it was resolved that it be endorsed by the Board, and the petition published in the annual report.

Small-pox at Wilkes-Barre.

24. Small-pox at Wilkes-Barre. The Secretary reported that in the early part of the present month small-pox occurred at Wilkes-Barre, being imported from Nanticoke. Inspector Taylor reported that prompt action had been taken by the authorities and the Secretary had written to the authorities approving of such action.

Both cases died, but no further outbreak occurred, the disease being apparently stamped out.

Health ordinance at Meadville.

25. Health ordinance of Meadville. A circular containing admirable regulations for placing cities in a good sanitary condition had been issued by the board of health, city of Meadville.

It was resolved that these regulations be approved, and published in the annual report.

Diphtheria at Fleetville.

26. Diphtheria at Fleetville. Dr. F. B. Davidson had reported a large number of cases of diphtheria in that town and had asked for circulars thereon for distribution, and the circulars had been sent as requested.

Health report of York

27. Annual report of the health officer of York. The Secretary stated that Dr. N. McClure was one of the most efficient health officers in the State, and advised the publication of his report.

Appointment as a Commissioner to inspect yellow fever districts in Florida.

28. Report of Secretary as member of Florida sanitary commission. The Secretary reported that the Florida legislature at its last session had passed a resolution inviting certain commissioners to visit the districts of that State which last summer were affected with yellow fever. The surgeon general of the United States marine hospital service had suggested him as a member of that commission, which consisted of Dr. Jackson Piper, President of the State board of health of Maryland, Dr. Samuel Chew, professor in the University of Maryland, Dr. W. F. Bruner, health officer of Savannah, Georgia, Dr. Eugene Foster, president of the board of health of Augusta, Georgia, and Mr. W. C. Chase, editor of the Climatologist of Washington, D. C. The commission visited and inspected the districts affected with yellow fever last year, and the quarantine stations at Tampa and Key West, had carefully observed the precautions adopted by the marine hospital service, through its efficient surgeon, Dr. Burgess at the Port of Havanna, and also inspected the Plant line of steamships. The commission had reported the result of their inspection to the Florida legislature, suggesting such further precautions as seemed to them wise and necessary.

While visiting the districts, the commissioners were the guests of the railroad companies of Florida and of cities and towns which they found it necessary to visit and were treated with great courtesy.

The Secretary's report was accepted.

Appointment as commissioner to assign limits of quarantinestation.

29. Appointment of Secretary as United States Commissioner to locate a Quarantine station at the mouth of the Delaware bay.

The Secretary reported his appointment by the Secretary of the Treasury of the United States to act in concert with commissioners appointed by the State of Delaware to assign the limits and fix the location of a quarantine station at Delaware breakwater, which had been done.

The report was accepted.

Nomination of medical inspector for Schuylkill district.

30. Nomination of a medical inspector for the Schuylkill district.

The Secretary regretted being compelled to announce the death of Sanitary Inspector McKibbin, of the Schuylkill district. He had addressed a communication to Dr. W. Murray Weidman asking him to accept such appointment, to which that gentleman had consented. On motion, it was

Resolved, That Dr. W. Murray Weidman be and is hereby appointed medical sanitary inspector for the Schuylkill district in the room of Dr. McKibbin, deceased.

Nomination of medical inspector for Juniata district.

31. Nomination of a medical inspector for the Juniata district.

Dr. A. B. Brumbaugh of Huntingdon was nominated by the Secretary, sanitary inspector for the Juniata district. On motion it was

Resolved, That Dr. A. B. Brumbaugh be and is hereby appointed sanitary inspector for the Juniata district.

The President declared Drs. Weidman and Brumbaugh duly elected.

State weather service report.

32. State Weather Bureau. The Secretary called attention to the fact that the State weather service sends out a monthly publication. He had been in communication with the State signal officer with regard to obtaining a modification of same suited to sanitary purposes, but he reported he had no funds available for such a purpose. The Secretary had accordingly had a meterological report prepared from the State weather service report, which he suggested should be inserted in Annual report.

The Secretary's action and suggestion were approved.

Financial report.

33. The financial report. The Secretary presented accounts covering vouchers 267 to 280, amounting to the sum of $576.35, which had been duly audited and approved by the executive committee.

The accounts were approved.

Nuisance at Preston, Bryn Mawr.

34. Nuisance at Preston. The Secretary reported receipt of complaint from Preston, suburb of Bryn Mawr, Montgomery county, that an odorless excavating company so dumped the contents of privy wells and cess pool matter as to create a nuisance. The Secretary having requested a more formal complaint he received notice that nuisance had been abated.

Nuisance from stagnant pond at McKee's Rock station.

35. Stagnant pond at McKee's Rock: A complaint had been received by the Secretary during the session to-day of a nuisance on the Lake Erie Railroad Company's property at McKee's Rock station, Stowe township, Allegheny county, arising from a pond of stagnant water covering about 1½ acres of ground, caused by interference with a natural water course by company's works, which resulted in producing a considerable amount of malarial disease.

Resolved, That an immediate inspection of the nuisance be made.

False certificate of death at McKeesport.

36. False certificate of death at McKeesport. The Secretary presented a communication just received, charging Dr. W. R. VanKirk of McKeesport with issuing a false certificate of death.

It was resolved on motion of Dr. Dudley that a telegram be sent to Dr. W. R. VanKirk of McKeesport, summoning him before the board to-morrow to answer the charge of issuing a false certificate of death he had given for child Frank Foley, who had died of diphtheria, the body being disinterred and shipped to Maryland. Dr. Dudley was appointed a committee to send the summons to this physician, as also to Dr. S. C. Campbell.

Supplies and stationery.

37. Supplies and stationery. The Secretary offered a copy of his requisition for supplies and stationery, and it was

Resolved, That the requisition for supplies and stationery presented by Secretary be approved.

Reports of standing committees.

Reports of standing committees being next in order, Mr. Howard Murphy, C. E., chairman of committee on water supply, reported that he had conferred with Mr. Richards respecting the sewerage of Reading. He believed that the air of the city would not be contaminated with flow of sewage into the Schuylkill river. There

Water supply of Reading.

was nothing to excite or create alarm, as the treatment of the sewage was by precipitation. The best possible precautions were being taken with cess pools, etc , at

Reading, to prevent contamination of the Schuylkill river.

The report was accepted.

The board then adjourned to 8.30 P. M.

The board re-assembled at 8.30 P. M. pursuant to adjournment.

Dr. J. H. McClelland European visit. Suitable credentials for same.

Dr. P. Dudley offered the following resolution:

WHEREAS, Dr. J. H. McClelland, a member of this board, is about to visit Europe for the benefit of his health,

Resolved, That he be assured of our best wishes for a prosperous voyage and safe return to his post of usefulness.

Further Resolved, That Dr. J. H. McClelland be and is hereby authorized to represent this board during his sojourn abroad, and that suitable credentials be issued to him for that purpose. The resolutions were passed.

Reports of standing committees.

Reports of standing committees being in order,

A report was presented by the Executive committee Dr. Pemberton Dudley, chairman, and was accepted.

Railway sanitation report.

Dr. J. F. Edwards, chairman of committee on preventable diseases, etc., presented a report on Railway Sanitation.

The report was accepted.

School hygiene report.

Dr J.H McClelland, chairman of committee on school hygiene presented a report which stated that there was more general attention paid to this subject now than formerly, especially in Pittsburgh. The City board of health sends weekly reports to all the public and private schools, giving the location of every case of contagious disease in the city, thus protecting the schools against contagions. This was the most practical recent advance in school hygiene.

The report was accepted.

Sanitary legislation report.

Dr. G. G. Groff, chairman of committee on sanitary legislation being absent, Dr. Lee reported that the committee had secured the appointment of standing committees on public health in the Senate and House of Representatives of the State legislature. The committee had addressed a letter to the presiding officer of each House in favor of the measure.

The report was accepted.

The reports of special committees being in order,

Sanitary convention report.

Dr. J. H. McClelland, chairman of the committee on Sanitary Convention reported the program of the con-

vention, to be held May 31 and June 1, in the Club theatre.

The report was accepted, and a vote of thanks extended to the chairman of this committee.

On motion, the board then adjourned to meet at the call of the chair.

June 1, 1889, 10 *A. M.*

The board met at the call of the President to hear the report of the committee appointed to meet Drs. VanKirk and Campbell in reference to the charge of issuing false certificates of death, and receive their explanation.

Reports of committee on cases of false certificate given at McKeesport and Fredericksburg.

The Secretary reported that Dr. VanKirk of McKeesport had appeared before the committee yesterday with reference to false certificate of death given for child Frank Foley.

Dr. Campbell also appeared with reference to alleged false certificate of death at Fredericksburg. Both doctors stated that it had invariably been their custom to refuse to give certificates for transportation of dead bodies, in cases where death had occurred from contagious disease; and that they had been deceived in regard to the nature of the disease existing previous to taking the cases; they also expressed regret, if, through these certificates any epidemic had been caused. It appeared from Dr. Campbell's statement that the immediate cause of the child's death was bronchitis, and he gave a certificate believing death to be due to this cause. He considered the parents of the child were responsible for carrying the disease to Fredericksburg rather than the dead body.

The committee recommended that Dr. Campbell be acquitted of the charge of intentional fraud, but that he be admonished as to giving certificates in future without personal knowledge of the case.

The committee further recommended that in consideration of Dr. Van Kirk's explanation he be not censured but cautioned to be more careful in future.

Resolved, That report and recommendation of committee be adopted, and that copy of resolution and report be sent to Dr. Probst, Secretary to the Ohio State Board of Health.

Adjournment of Board.

The Board then adjourned to meet at the call of the chair.

BENJ. LEE, *Sec'y.*

[NOTE. - In consequence of the receipt of the news of

the awful calamity at Johnstown, and the consequent sudden departure of the Secretary and Dr. Groff for the scene of the disaster, it was not found practicable for the Board to hold another session.]

Thirteenth Regular Meeting.

The thirteenth regular meeting of the Board was held at Johnstown, Pennsylvania, July 10th, 1889, at 11 A. M.

Present: Dr. David Engelman, President, Dr. J. F. Edwards, Dr. P. Dudley, Dr. G. G. Groff, Howard Murphy, C. E., and Dr. Benjamin Lee, Secretary.

On motion the reading of the minutes of the Pittsburgh meeting was dispensed with at present.

The Secretary presented his report, which included the following items:—

1. Special expenses flooded districts.

Special expenses flooded districts.

The Secretary stated that Governor Beaver had assured him that the special expenses of the Board and its officers in the sanitary work in the flooded districts would be paid without drawing on the reguiar stated appropriation of the Board.

2. Reports on sanitary measures for the preservation of the public health in the flooded regions of the Commonwealth, (a) Johnstown and the Conemaugh Valley, Dr. Benjamin Lee, Secretary.

Reports on sanitary measures in the flooded regions.

(1) Report of Chief Medical Inspector Dr. W. E. Matthews.

The report of Dr. Matthews, Chief Medical Inspector at Johnstown, to the Secretary detailing in brief the measures adopted by the deputy medical inspectors of the Board in Johnstown and adjacent flooded districts was read.

The report was accepted, and it was ordered that it be referred for publication.

(2) Drs. Probst and Carrington's report.

The report of Drs. Probst and Carrington on the water supply of Johnstown, showing it to be in good condition was read.

The Secretary followed this report by stating that he had yesterday discovered about 150 cattle grazing on the banks of Mill creek, to which stream they had full access. This creek furnishes the water for Johnstown. He had notified the proper authorities to abate the nuisance.

Report on water supply of Johnstown.

Sanitary survey and inspection of the flooded district.

(3) The sanitary survey of flooded districts. The Secretary showed a voluminous report of a sanitary survey of every house from South Fork to Nineveh, giving number of rooms, inmates, number of children, cases of sickness, sanitary condition of rooms, cellars, privies, etc., and embracing the valleys of South Fork, Stoney Creek, Little Conemaugh and Conemaugh. Number of houses examined 1,996 in 20 towns and villages. Daily reports from all of them are still being received. This survey was made under the direction and supervision of Dr. Groff.

Work of the sheriffs.

(4) Work of the sheriffs.

The Secretary made a further statement as to the work of the sheriffs of the flooded regions in the destroying of debris, covering human bodies and burning carcasses.

The Secretary suggested that reports from the remaining flooded districts included in his report be read by title, except that from Huntingdon, and that matters requiring action by the Board be introduced under the head of "New Business."

The suggestions were adopted.

Reports on the flooded districts from inspectors.

The following are the reports thus read:

(b) Report on Pittsburgh and the Allegheny valley, by Dr. Benjamin Lee, Secretary.

(c) Report on the Susquehanna valley, by Dr. Paul A. Hartman, Medical Inspector.

(d) Report on the Valley of the West Branch of the Susquehanna, by Dr. C. B. Dudley, Medical Inspector.

(e) Report on the Susquehanna valley, by Dr. Wm. Leiser, Jr., Medical Inspector.

(f) Report on the Cumberland valley, by Dr. Paul A. Hartman, Medical Inspector.

Nuisance at Kingsley, Pa.

3. Nuisance from creamery at Kingsley, Pennsylvania.

The Secretary read a report on the inspection of a nuisance from a creamery at Kingsley, Luzerne county, Pennsylvania, which in consequence of his action had been abated.

The action of the Secretary was approved.

Sanitary condition of Huntingdon, Pa.

4. Sanitary condition of Huntingdon, Pennsylvania.

A complaint had been received from Mr. J. C. Blair, Burgess, respecting the sanitary condition of Huntingdon.

It appeared from the report of the Secretary that he considered a special inspection unnecessary as there is

a district inspector at the place, and the report of such inspector indicates that there is no need for special action by the Board.

5. Donation of disinfectants from England.

Donation for the flooded districts

The Secretary reported the receipt of £500 worth of disinfectants from Messrs. Quibell Bros. He had conveyed the Board's thanks to the firm for this donation.

The Secretary's action was approved, and he was further instructed to extend the thanks of the Board also to the Steamship company for transportation of donation free of charge.

Recess for personal inspection of Johnstown.

The Board then took a recess in order to make a personal inspection of the work accomplished in Johnstown. After a drive through a portion of the devastated district, the Board resumed its session at 4.15.

Reports of standing committees.

Report of standing committees.

The reports of standing committees, being next in order, were now read and considered.

Report of Committee on Preventable Diseases.

The chairman of the committee on preventable diseases, disinfection, etc., Dr. Edwards, stated that he had a report of his inspections in the flooded regions, made by order of the Governor in preparation, which would be shortly forthcoming.

Report of Committee on water Supply, etc.

The chairman of the committee on water supply, drainage, topography, mines, etc., Howard Murphy, C. E., reported certain progress in reference to the drainage of Altoona. On motion Mr. Murphy was requested to put his report in writing and hand same to Secretary.

Action of Secretary Lee and Dr Groff at Johnstown approved.

Action of Dr. Lee, Secretary, and Dr. Groff.

On motion of Dr. Pemberton Dudley it was unanimously resolved that all action thus far taken by the Secretary and Executive Officer and by Dr. Geo. Groff, his associate, in relation to the sanitary condition of the regions devasted by the floods of May 31, 1889, in the Conemaugh valley, and elsewhere in the state, be and the same is hereby approved.

Election of president

The election of a president for the ensuing year being next in order, the Secretary was instructed to cast a single ballot for Dr. David Engelman, of Easton; this was done and Dr. Engelman was declared to be re-elected president for the ensuing year.

New Business.

New business.

Dr. Geo. Groff asked if the Juniata and Susquehanna valleys, should not have more attention from the Board than they had hitherto received.

Inspection of Juniata and Susquehanna valleys. More attention urged for these valleys.

The Secretary reported that the whole district named had been inspected, the condition existing had been declared a nuisance and the Governor had taken action thereon.

Strict supervision of the Conemaugh and other valleys during autumn and summer.

Dr. J. F. Edwards reported that by instructions from the Governor he had inspected certain parts of the district and made to the Governor a careful report thereon.

Mr. Howard Murphy moved the appointment of a committee consisting of the President, Secretary and three other members to maintain during the summer and autumn a constant sanitary supervision of the Conemaugh, Juniata and Susquehanna valleys, and to take, on behalf and by authority of this Board, such action as may be found necessary to preserve the public health in the flooded districts.

The motion was adopted, and the chairman appointed Drs. Groff and Edwards, and Mr. Howard Murphy.

Resolutions of thanks to heads of Pittsburgh departments and others for aid, etc.

The Secretary offered the following resolutions:

Floods.

Resolved, That the thanks of the State Board of Health are due to the department of public safety of the city of Pittsburgh for the prompt and generous assistance rendered to the Board and to the citizens of Johnstown in their hour of calamity, in the work of preserving the lives, health and property of the survivors of the recent disastrous flood in the Conemaugh valley and the city of Johnstown.

Names.

Resolved, That to J. O. Brown, chief of department of public safety; Gamble Weir, superintendent of the bureau of police; Samuel N. Evans, superintendent of the bureau of fire; Thomas N. Baker, superintendent of the bureau of health; Morris W. Mead, superintendent of the bureau of electricity; Martin G. Frank, building inspector, and to each member of their several forces, thanks are returned for the intelligent, efficient and courteous manner in which their duties were performed.

Resolved, That an engrossed copy of these resolutions be transmitted to the superintendent of public safety of Pittsburgh, and a printed copy to each of the members of the department who rendered service in Johnstown.

Thanks to mayor of Allegheny.

Resolved, That the thanks of the State Board of Health are hereby tendered to Mr. R. I. Pearson, mayor

of the city of Allegheny, for his prompt action in sending a portion of the sanitary police of that city to aid this Board and the stricken city of Johnstown and its suburbs, in their efforts to prevent the occurrence of disease as a result of the disaster which has recently befallen this beautiful valley.

Resolved, That the thanks of the Board are hereby tendered to each member of the force for his cheerfully rendered and efficient service.

Resolved, That this resolution be engrossed and transmitted to his honor, Mayor Pearson.

Resolution of thanks to physicians.

Dr. Groff moved the following engrossed resolution of thanks to the physicians who aided in the sanitary work of Johnstown:

Resolved, That the thanks of the State Board of Health are eminently due to and are hereby tendered to Dr. ——— ———, for his arduous, indefatigable and efficient services, so generously rendered, as a volunteer member of the sanitary corp of the Board at Johnstown, in aiding in the important work of preventing epidemic disease as a result of the recent disastrous flood in the Conemaugh valley.

The names of the physicians are as follows: Drs. James McGrew and Frank Phillips, Pittsburgh. Drs. M. Howard Fussell and J. Allen Smith, Philadelphia. Dr. T. L. White, McKeesport; Dr. A. J. Graham, Peoria, Illinois. Dr. F. A. Marvell, Atlantic City, New Jersey. Surgeon P. M. Carrington, United States Marine Hospital Service.

Thanks for contributions.

Ordered that the Secretary be authorized and requested to extend the thanks of this Board for contributions received by and services rendered to the Board in its sanitary work.

Resolution of thanks to Dr. Lee, secretary, and to Dr. Groff.

On motion of Mr. Howard Murphy it was ordered, that Dr. Edwards be a committee of one to prepare a suitable resolution of thanks to Dr. Benjamin Lee, Secretary, and to Dr. Geo. G. Groff, for their eminent services rendered to the public as the representatives of this Board.

Also that when the Board adjourns it be to meet at the call of the chair.

Type written reports.

Also that when any of the standing or special committees of the Board have to prepare documents for submission to the Board, that they shall be authorized to

employ a stenographer and to have the same type-written at the Board's expense.

Notice of meetings.

Also that hereafter for all regular and special meetings notices of said meeting shall be given ten days in advance when practicable, and that in case of special emergency, when such notice cannot be given, members be notified by telegraph.

On motion the Board then adjourned.

BENJ. LEE, *Secretary.*

SPECIAL MEETING, *September 27th*, 1889.

A special meeting of the Board was held at the temporary office of the Board in Johnstown at 10.30 A. M. on Friday, September 27th, 1889.

The following members were present during the sessions:—Dr. J. F. Edwards, Dr. P. Dudley, Dr. G. G. Groff and Dr. Benjamin Lee, Secretary.

On motion Dr. J. F. Edwards was called to the chair.

Inspection of entire Johnstown flooded district.

A recess was immediately taken, and the members of the Board in company with Captain George C. Hamilton, chief engineer, and W. E. Matthews, M. D., chief deputy medical inspector, made an inspection of the entire district. The members then re-assembled at the office of the Board at 4 o'clock P. M.

The Secretary stated the reasons for the call of the special meeting, which were as stated in the notice:—

Decision as to further sanitary supervision of flooded regions, the object of meeting.

"To decide upon the sanitary work still remaining to be done in the Conemaugh valley, and determine the time at which the special sanitary supervision of the flooded regions may with safety be discontinued," and in order to bring the subject before the Board in all its bearings, made the following report:—

Report of the secretary.

The special object for which this meeting has been called, is to give the Board an opportunity of inspecting the results of the work done by the Secretary in abating the nuisance existing at Johnstown, by directions of the Board, and to give an authoritative declaration of the length of time still necessary to complete the work and of the date at which the declaration of nuisance may be removed.

It will be observed that the Board will not be called upon to pronounce Johnstown "in good sanitary condition," as seems to be the general impression. There are few cities in the State of which this could be said.

Sanitary condition of Johnstown.

What the Board is required to decide is, that the conditions no longer exist which rendered Johnstown and the adjacent boroughs in the Conemaugh valley a menace to the health of their own citizens and of other portions of the State, to such an extent as to warrant the interference of the State in the absence of local health authorities, and in view of the absolute inability of the citizens themselves to remove them. As an aid to arrival at this decision the Secretary would call attention to statements contained in Health Bulletin No. 8, issued September 16, 1889, which reads as follows:—

Secretary's report on Johnstown.

"The tendency to disturbances of the bowels noted "in the last bulletin has happily disappeared. In the "meantime typhoid fever, originating at a farm house "about two miles back in the country, has made its way "first into the village of Moxham, which entirely escaped "the flood, and thence into the town. A spring and "pump, to which several of the earliest cases appeared "traceable, and to which the entire neighborhood re-"sorted in preference to using hydant water, were con-"demned by the Board and the use of their waters for-"bidden. The number of cases has been considerable, "although not large as compared with that of those "occurring in other towns at the same time. The type "of the fever has been mild, and the mortality very "slight. The reports of the past week show that its "prevalence is decidedly decreasing. This forms at "present the only exception to the general good health "of the community, which the Board has every reason " to anticipate will continue if ordinary sanitary pre-"cautions are observed."

Résumé of work done by Board in Conemaugh Valley.

The Secretary then presented a résumé of work done in and about Johnstown, and in the streams, as contained in the reports of Dr. W. E. Matthews, chief deputy medical inspector, and Dr. G. W. Wagoner, deputy medical inspector for the south side, showing in brief outline the nature and extent of the sanitary work, as prosecuted by the Board under their supervision.

The Secretary also asked attention to the proposed action of the Relief Commission in regard to the removal of the unrecognized dead, which is as follows:

Request of committee on removing and burying the unidentified dead.

The committee on removing and burying the unidentified dead consists of J. B. Kremer, chairman, Herman Baumer, James McMillen, James M. Shoemaker and John Henderson. A meeting of the committee was held

at Secretary Kremer's headquarters, at Camp Hamilton, last night, and steps were taken to have the work of removing the dead done as quickly as possible. Mr. John Henderson was given immediate charge of the removal and other members of the committee were given other portions of the work to attend to.

Mr. Herman Baumer, a member of the committee, had waited on the Secretary in order to obtain the permission of the Board for the removal above referred to, and for instructions as to the precautions necessary to be observed in its accomplishment.

The report of the Secretary, including that of Drs. Matthew, and Wagoner, were accepted.

The Secretary then offered the following resolutions,

State to cease operations.

Resolved, That the conditions which led to the declarations of a nuisance prejudicial to the public health in Johnstown and the Conemaugh valley, in consequence of the flood of May 31st, have been so far removed that it will be safe for the State to cease its sanitary operations in this district on the 30th day of September, 1889, and that the Board will therefore withdraw its special supervision of this district on that date.

Sanitary precautions to be observed by authorities.

Resolved, That in view of the possibility of the occurrence of disease on the return of hot weather in consequence of the large deposits of organic matter left by the flood, it is of the utmost importance that the local authorities shall continue the employment of all ordinary sanitary precautions, and, further, that in order to accomplish this work in the most efficient manner the Board recommends that the municipalities of Johnstown and the neighboring boroughs unite in the establishment of a Board of Health of the Conemaugh valley, which shall have charge of the sanitary interests of the entire region.

The resolutions were adopted unanimously.

Unidentified dead committee's request granted.

On motion, permission was granted to the committee on removing and burying the unidentified dead to proceed with this work in accordance with the regulations of the Board, and the Secretary was instructed to formulate such special provisions as would meet the exigencies of the case.

The Board then adjourned.

BENJ. LEE, *Secretary.*

Fourteenth Regular Meeting.

The Fourteenth regular meeting of the Board was held at the Supreme Court Room Harrisburg, November 13th, 1889, at 9.30 A. M.

Present:—Dr. J. F. Edwards, Dr. G. G. Groff, Dr. P. Dudley, Dr. J. H. McClelland, Howard Murphy, C. E., and Dr. Benjamin Lee, Secretary.

In the absence of a President the Board was called to order by the Secretary.

On motion Dr. J. F. Edwards was called to the chair; An order of business presented by the Secretary was adopted as the order of the day.

The Secretary announced that since the last regular meeting the term of Dr. David Engelman, as a member of the Board had expired, and the Hon. Samuel T. Davis, M. D., of Lancaster had been appointed by His Excellency, the Governor, to fill the vacancy. The office of president was therefore vacant.

Nomination of a president pro tem, being in order, the Secretary nominated Dr. Geo. G. Groff, and, there being no other nomination, it was, on motion resolved that the Secretary be instructed to cast a single ballot for Dr. Groff as president pro tem., This was done and Dr. Groff was declared unanimously elected, and took the chair.

The minutes of the Twelfth Regular Meeting held at Pittsburgh, May 30th, 1889, was read.

Mr. Murphy moved that in order to preserve the continuity of the record a note be appended to the minutes stating that the occurrence of the Johnstown flood, prevented the chair from calling a final session as was contemplated. The resolution was carried and the minutes approved.

The Minutes of the Thirteenth Regular Meeting held at Johnstown, July 10th, 1889, were also read.

Mr. Murphy suggested the following correction, that in the motion authorizing members to employ a typewriter, in preparing reports, the words "and stenographer" be introduced.

Dr. Dudley suggested the following correction, that the statement made by Dr. Van Kirk, be amended to read "that the conveyance of scarlet fever to Fredericksburg, Ohio," and "not the death of the child, was due to the carelessness of the child's parents." These suggestions were adopted and the minutes approved.

The Minutes of a Special Meeting held at Johnstown, Sept. 27th, 1889, were also read and approved.

The Secretary then presented his Report which included the following items:

1. Annual Report.

The secretary read his Fifth Annual Report to the Board. It was accepted with the thanks of the Board, and ordered to be transmitted

to His Excellency, the Governor, together with the minutes of the Board of the past year, as the Annual Report of the Board. It was further ordered that such portions of it as related to the work of the Board in Johnstown, and the other flooded districts, be printed and published in a separate monograph.

The Board then adjourned to 2.30 P. M.

SECOND SESSION.

The Board reconvened at 2.30 P. M., when the Report of the Secretary was proceeded with, as follows:—

2. Report of the work of the Board in Johnstown subsequent to the meeting of the Board September 27th, 1889, by Benjamin Lee, M. D., Secretary.

The proposal to withdraw the state forces on the 30th, of September had called forth such serious remonstrance from the citizens of Johnstown, that after consultation with His Excellency, Governor Beaver, it had been decided to permit the special work of opening the choked mouths of sewers and freeing the channel of Stony Creek river from obstruction to the flow of sewerage and drainage to be continued for a few days, without re-organizing the general work on streets, cellars and yards. This was successfully accomplished to the great satisfaction of the people, and on October 10th, a final report was addressed to His Excellency declaring the nuisance abated on and after October 12th, in the name of the Board.

The Report was accepted, thereby endorsing the action of the Secretary in declaring the nuisance in the Conemaugh valley abated.

3. Second Annual Report of the State Pharmaceutical Examining Board of Pennsylvania.

The Secretary presented the Second Annual Report of the State Pharmaceutical Examining Board of Pennsylvania, and suggested that it be inserted in the Board's Annual Report. The suggestion was adopted.

4. Meteorological Report for the year ending November 1st, 1889.

Resolved, That abstracts of the reports of the Pennsylvania State Weather Service, with maps be published in the Annual Report as suggested by the Secretary.

5. Report on insanitary condition of Mexico, Pennsylvania, through flood. By C. B. Dudley, M. D., medical inspector, Altoona.

It appeared from the report that a large quantity of grain, and other material was fermenting, and in bad condition and threatening the public health. The Secretary had sent disinfectants and instructions, and had notified the Governor of the need of assistance at this place. The report was accepted.

6. Suggestion for a Hospital for Infectious Diseases with Crematory. By L. M. Davis, M. D., of Lancaster.

Dr. Davis had been for some time perfecting a quarantine hospital and crematory, so arranged that all air infected by patients should be destroyed, and isolation perfected.

The Secretary had replied and had referred plans and letters to Surgeon General Hamilton, of the United States Marine Hospital Service.

The report was accepted, and the Secretary was instructed to obtain cuts and plans for publication in the Annual Report.

7. Report of Smallpox at Canonsburg. By J. Guy McCandless, M. D., and Medical Inspector J. R. Thompson, M. D., of Pittsburgh.

Dr. Thompson had vaccinated the persons in the hotel where the case originated, had disinfected the bed linen etc. and fumigated the rooms. He also distributed the disease circular No. 8, in the district. No other case occurred.

The report was accepted.

Report of Inspection at Millerstown. By Medical Inspector Paul A. Hartman, M. D., of Harrisburg.

Dr. Hartmann reported there were nine Slaughter Houses in the town, all of which were found in a bad condition, to which he attributed two cases of typhoid fever. He further reported the town to be without sewerage, nothing but surface drainage being provided for, all kinds of filth were exposed. He had given directions for all insanitary premises to be cleansed. He also recommended the removal of the slaughter houses outside the town.

The report was accepted, but that part relating to slaughter houses only was approved.

9. Report on Flooded Districts on West Branch of the Susquehanna River. By William Leiser Jr., M. D., Medical Inspector.

On instructions from the Secretary, Dr. Leiser had made a thorough search for dead animals along the streams from Montgomery Station to Georgetown; Penn's Creek, through Snyder and Union counties; Middle Creek through Snyder county; White Deer and Buffalo Creeks through Union county; a total distance of one hundred and fifty miles, and had found and burned the carcasses of fifty eight animals. He further reported that the people in the districts had formed a Local Board and were placing the towns and villages in sanitary condition.

The report was accepted, and the action of the Secretary and Medical Inspector were approved.

10. Report of smallpox at Glen Lyon. By L. H. Taylor, M. D., of Wilkes-Barre, Medical Inspector.

Dr. Taylor reported the disease to have been contracted on board a canal boat below Shickshinny. The patient had been promptly removed from the boarding house where he resided, in which were twenty people, to a pest house erected specially for the case, and which was properly isolated. Those exposed were vaccinated and no other person took the disease.

The report was accepted.

11. Report on typhoid fever at Dry Run. By R. L. Sibbet, M. D., of Carlisle, Medical Inspector.

Dr. Sibbet reported that on instructions from the Secretary he had investigated the typhoid fever epidemic at Dry Run, from which it appeared that eighteen of the cases arose from the use of water from one well, into which human and animal excrement which was deposited near by, found its way. There were ten wells in the village, only two of which contained water fit for domestic purposes. In the valley there were about sixty cases of fever. He had addressed a communication to the people living in this valley, advocating the adoption of stringent sanitary precautions; had condemned the use of water from several wells; distributed circulars on prevention of typhoid fever; and had strongly urged them to obtain an Act of Incorporation as a Borough, in order to take organized action for the protection of the public health.

The report was accepted, and referred for publication and the action of the inspector cordially approved.

12. Report on inspection of the old bed of the Pennsylvania Canal at New Florence. By H. F. Tomb. M. D., Deputy Medical Inspector.

Dr. Tomb stated that he had found the water in the canal to be stagnant, and generally in a foul condition. From six inches to about two feet of mud of a putrid nature, was found in the bottom of the Canal; the weeds on the banks and surface shut out the sun. There was a bad odor from it, and many cases of malarial fever were attributed annually to its insanitary condition. He stated that the canal had been in this state for some years, and suggested remedies for the abatement of the nuisance.

The Secretary had addressed a communication to Mr. T. T. Wierman, chief engineer of the Pennsylvania Canal, on the subject. He had replied promising that the matter should receive immediate attention.

The report was accepted, and the action of the Secretary and the suggestions of the deputy inspector were approved.

13. Report on Typhoid Fever at Wilkes-Barre. By L. H. Taylor, M. D., Medical Inspector, and Benjamin Lee, M. D., Secretary.

An alarming outbreak of typhoid fever had prevailed during the summer months at Wilkes-Barre. Up to October the total number of cases reported had exceeded six hundred and fifty and many cases it was suspected, had not been reported. In his report Dr. Taylor stated that nearly all the cases were those of persons using the Laurel Run water. He had made an exhaustive examination of the sources of supply of this water from the mountains, and had discovered opportunities for contamination. The Secretary had subsequently made a personal inspection of the streams, and verified Dr. Taylor's observations. The reservoirs had since been thoroughly cleaned. In addition to this, wells had been sunk on the opposite side of the river, to obtain water by percolation from the river.

The report was accepted, and referred for publication.

14. Report on case of glanders at Mt. Gretna. By Benjamin Lee, M. D,. Secretary.

The Secretary reported that in August, he had received a telegram from Veterinary Surgeon Huidekoper, stating that there was a glandered horse at Mt. Gretna, and asking for instructions, as he had used his best efforts to get instructions from the Secretary of Agriculture, but unavailingly. The Secretary had replied, giving instructions for the horse to be shot. His Excellency, Governor Beaver, at this period visited the camp, and concluded that the animal might safely be quarantined.

The report was accepted.

15. Report of Inspection of Susquehanna and Nittany valleys. By George G. Groff, M. D.

Dr. Groff reported that he had first visited Williamsport and found it in fairly good condition, the people having cleaned the streets, and taken other sanitary precautions.

He then visited Jersey Shore, which he found in a very bad state. The streets were covered with mud sixteen inches deep; the whole town being covered with this deposit from the flood. The walls of the cellars were reeking with wet and slimy matter, and generally everything appeared in a condition detrimental to health, the people seemingly being unable to help themselves.

Tioga was next visited. The flood had also deposited here mud and rubbish, nine or ten inches deep, in the cellars, and the district had been under water, but the inhabitants had cleaned up the place to a great extent.

Lawrenceville was also found in a bad condition, but the flood had not been felt so severely here as at Tioga.

The Health Officer at Lock Haven reported that that town had been cleaned up and was in good condition.

The Nittany valley was next visited. Here in some of the villages, the destruction to life and property by the flood had been nearly as severe, in proportion to the population, as at Johnstown. Everything was in bad shape, and there was evidence of great suffering.

Renova had entirely recovered. The flood had stopped at Driftwood, and no help was needed there.

Huntingdon had felt the flood severely, but very little remained in bad sanitary condition there except, the slaughter houses.

Punxsutawney was also inspected. It had been flooded, but was in fair condition.

At Shimma the flood had filled up numerous hollow places in the streets with wood-bark, impregnated with sulphuric acid which was not injurious to any great degree.

The condition of Jersey Shore and Tioga was declared insanitary and

a nuisance, and Dr. Groff had suggested that assistance be given to the people in these houses, and that inspectors be appointed to supervise these valleys during the summer. The Secretary stated that he had reported the condition thus detailed, to His Excellency, the Governor, who had sent money to the districts mentioned as requiring help, and that he had himself, supplied disinfectants and circulars. Dr. Holloway had been instructed to keep a strict supervision of the towns in the valley.

The report was accepted.

16. Report of Inspection at Kilkenny. By William B. Atkinson, M. D., of Philadaelphia, Medical Inspector.

Dr. Atkinson reported that acting on instructions from the Secretary, he had inspected Kilkenny, and found nuisacnes from manure heaps, wells and imperfect drainage.

The Secretary had given instructions for the abatement of these nuisances, which had been attended to.

The report was accepted.

17. Report of inspection at Phillipsburg, Centre county. By G. G. Groff, M. D.

Dr. Groff reported that cholera infantum at this town, with a population of three thousand, was very severe. He had examined the water supply, which appeared to be excellent. He attributed the sickness to hot days and cold nights, and had freely distributed the circulars on care of infants. The flood at this place had proved a benefit in thoroughly cleaning the streets.

The report was accepted.

18. The Secretary had prepared an explanatory circular letter on "the establishment and formation of local boards of health in Pennsylvania" which he now read.

The letter was approved, and ordered to be printed as read.

19. Report of inspection at Hulmeville. By William B. Atkinson, M. D., Medical Inspector.

Dr. Atkinson reported finding twenty-six pigs in pen of a slaughter house, which were being fed on blood and slaughter house offal. There was no floor to the pen and the drainage ran on the ground.

The Secretary had given instructions for the pen to be removed outside of the town; the place to be cleaned up, and the proprietor to cease feeding swine on slaughter house offal.

The report was accepted, and the Secretary's action approved.

Report on typhoid fever at Nanticoke. By L. H. Taylor, M. D., Medical Inspector.

Dr. Taylor reported that the disease had been confined to two families who used water from one well. On analyzing samples of this water it was found to be contaminated, and on instructions from the Secretary, the use of this water was forbidden.

The report was accepted, and the action approved.

21. The Secretary reported that sometime in August, some of the principal residents of Muncy complained that a company intended to construct water-works to supply that town with water from a source which would render it liable to pollution, and dangerous to health; and to construct a dam in connection therewith, which would be a menace to the people living in the valley below.

Dr. G. G. Groff had made a thorough examination of the sources of supply. He reported the proposed pool, or reservoir, to be in a narrow gorge, and that in his opinion, a sufficient constant supply of water could not be maintained without a dam fifty feet in height. The proposed sources of supply were from eleven springs in the immediate neighborhood, but owing to the excreta from privies, drainage from kitchens, and other liquids from several farms, passing into the streams which flowed from these springs, he regarded these sources of supply as dangerous. Neither could the drainage from these farms be diverted into other channels owing to the conformation of the surface. He considered that a serious epidemic might be caused by the use of this water, should a case of fever occur in any of these farm-houses, and further, that the proposed dam would be a constant menace to the people living in the valley.

Other sources of supply of a purer nature, were open to the company, but the one contemplated was the cheapest.

He recommended the Board to advise the borough council, in the interests of the public health, not to accept this source of supply.

The Secretary stated that he had received several communications in favor of the proposed scheme, and requested the Board not to interfere. Such works were, however, often speculative schemes got up by persons living at a distance who were quite indifferent as to the quality of the supply, as they were not compelled to use it.

After considerable discussion it was resolved that the report of Dr. Groff be accepted and approved, and that the authorities of Muncy be notified that the proposed supply is, in the opinion of the Board, liable to be impure and injurious to health, and that the Board, therefore, advises them not to accept it.

22. Report on disinfection of clothing and household effects at Rankin. By J. R. Thompson, M. D. medical inspector.

The Secretary read a communication from the Braddock Wire Company, stating that the premises of one of their tenants who was under arrest, was required, but the furniture and effects were in such a filthy condition as to be a nuisance. On investigation Dr. Thompson found the facts, in the main, as reported, but declined to destroy the furniture. He had disinfected the linen, woolens, etc., by boiling, and taken such other precautions as rendered the premises and effects sanitary.

The report was accepted, and action approved.

23. Report of inspection of Trout Run. By E. D. Payne, M. D., medical inspector.

Dr. Payne reported that his investigation led him to conclude that an epidemic of typhoid fever at this place was caused by the June flood washing out the privy vaults, and thus contaminating the wells. The discharges from former cases of typhoid had been emptied into these vaults without being disinfected. He had instructed the people to clean and disinfect their cellars, and have their premises placed in sanitary condition. If this supposition were correct it would show that the typhoid germ might retain its vitality for many years in a suitable soil.

The report was accepted.

24. Report of inspection as to cause of dysentery at Danville Insane Asylum. By Benjamin Lee, M. D., Secretary.

By request of Dr. Schultz, the superintendent, who reported a large number of cases of dysentery at the asylum, the Secretary had made a careful inspection at this institution. Samples of the water used were sent to Dr. Cresson for analysis, and found to be contaminated. He considered it possible that that portion of the suction-pipe supplying the drinking water, which passed beneath the bed of the canal might leak, thereby contaminating the water with that of the canal.

Just prior to this inspection Dr. Schultz had made arrangements, on a grand scale, to boil the whole of the drinking water of the establishment by introducing super-heated steam from the boiler into a series of large, air-tight, iron cylinders, and at once the cases began rapidly to diminish.

The report was accepted.

25. Report of inspection at Lock Haven. By G. G. Groff, M. D. At the request of several residents, Dr. Groff had inspected Lock Haven, it being reported that there was much fever and sickness there. He had called upon the health officer and several others, principally physicians, and while some thought there was an unusual amount of sickness, others considered that there was nothing serious to be apprehended. He had visited the reservoir, the water of which appeared clear and wholesome. Unless there was pollution of water from the farms at its source, he was unable to account for the typhoid fever prevalent. There were at present one hundred and forty cases of fever at Lock Haven.

At Renovo and other places, the water supply from the mountains appeared pure, and yet there was much sickness in these places.

Mr. Howard Murphy considered that we had no more uncertain or dangerous sources of supply than mountain streams, unless they were protected by the purchase of considerable tract of land on both sides of them.

The report was accepted.

26. Report of analysis of suspected waters from Butler, Pennsylvania. By Charles M. Cresson, M. D.

Dr. John E. Byers had reported the prevalence of typhoid fever at Butler, which was attributed to impure water. He submitted samples for examination, one of which was found to contain typhoid excreta. The Secretary had reported the fact to Dr. Byers pending a more complete analysis and examination.

The report was accepted.

27. Report on diphtheria at Gallitzin. By C. B. Dudley, M. D., medical inspector.

Dr. Dudley reported that another severe epidemic of diphtheria had been ravaging Gallitzin. He had visited the district on October 9th, and again on October 15th, and found the outbreak serious. He attributed the disease to insufficient and impure water supply, lack of cleanliness, and want of drainage. He had held a meeting of the citizens, and pointed out the necessity of a stricter regard for cleanliness; had distributed the Board's circulars, and taken other precautions. The epidemic was now abating. Much support had been received from the Catholic priest, Father O'Riley.

The report was accepted, and the action of the inspector approved.

28. Report of inspection at Confluence. By C. L. Gummert, M. D. medical inspector.

The inspector reported a serious epidemic of typhoid fever at this borough, and an entire absence of precautions to prevent its spread.

The Secretary stated that Dr. Gummert had endeavored to form a local board of health at Confluence, but owing to a dispute between the resident physicians this had not been fully accomplished. Dr. Gummert had approved a health officer, which action the Secretary had disallowed, as he considered the inspector had exceeded his powers, and those of the Board. He had requested Dr. Gummert to urge the council to assume the responsibility, as it legally belonged to them alone.

The report of the Secretary was accepted, and his action approved.

29. The Secretary reported that at the request of the authorities of Allegheny, he had recently inspected Butcher's run, accompanied by Dr. J. R. Thompson and Dr. J. H. McClelland, health officer, James Bradley, and several of the sanitary committee of the city council. The difficulty with which the city had to contend was that the run lay partly in an adjoining township, and beyond the reach of its ordinances.

They carefully examined the entire uncovered portion of the run from its source, and found the stream polluted by sewage, garbage, and butcher's refuse, and he had forthwith condemned it as an unqualified nuisance, and advised the construction of a sewer as the remedy, and had notified the property-holders in the township to do their part in abating it, under a penalty of $100.

Dr. McClelland stated that since this action on the part of the Secretary, the authorities had given instructions for the covering of the stream by a properly constructed sewer.

The report was accepted, and the declaration of the Secretary sustained.

30. Report of inspection at Berwyn. By Howard Murphy, C. E.

Mr. Murphy reported the stream complained of to be badly contaminated by sewerage from a hotel. The water was unwholesome, in fact poisonous, and the drainage a nuisance. The hotel authorities had given assurance that they would endeavor to abate the nuisance, and he suggested that further action be postponed until their engineer, General Thayer, could mature his plans.

The report was accepted, and recommendation adopted.

31. The Secretary reported that accompanied by Drs. J. H. McClelland and J. R. Thompson, he had recently inspected the Rider Garbage Furnace Company's furnace, at Allegheny. He found the furnace destroying garbage at a rapid rate, and was informed by the fireman that it was fully capable of destroying all the garbage the city furnished.

The claim made by the company is that no fuel is necessary, except just at the first heating up of the furnace, but he found coke being used in the grate in front. With that exception the furnace appeared to be performing its work inoffensively, and in an efficient manner.

The report was accepted.

32. On the same day the Secretary had examined the abbatoir at Herr's island, which was found very complete, clean and well ventilated. The animals were strung up by the heels before being stunned and the jugular vein and arch of the aorta being at once severed, the blood drainage was very thorough. The disposal of filth and refuse was dealt with in a very efficient manner. An essential feature of this establishment was the profitable disposition made of every portion of the animals. The absence of any offensive odor in every part of the building was remarkable. The Secretary believed it to be the most scientifically constructed abbatoir in the country.

The report was accepted.

33. Report on transportation for medical inspectors.

The Secretary reported having communicated with the Philadelphia and Reading Railroad company on this subject. A satisfactory reply had been received. Dr. W. B. Atkinson had been appointed an employé of the company, and for future inspections would travel free where it was necessary to use the company's lines.

The report was accepted.

34. Nomination of medical inspectors.

The Secretary proposed the formation of a new district comprising the counties of Cambria, Westmoreland, Indiana and Armstrong, to be named the "Conemaugh district."

The motion was carried.

The Secretary nominated Dr. W. E. Matthews, of Johnstown, as medical inspector of the Conemaugh district. The nomination was confirmed, and Dr. Matthews was declared duly appointed.

35. The Secretary presented his requisition for stationery and supplies received for the year, from the Secretary of the Commonwealth.

It was ordered to be printed.

36. Financial report.

The Secretary presented the financial report, showing the expenditure for the year ending ——.

The following are the summarised items:

Travelling expenses,	$756 02
Inspections,	391 46
Incidentals, including storage and current accounts,	1,444 04
Vaccine virus and vaccination,	79 11
Sanitary journals,	9 00
Analyses,	33 00
Typewriter,	12 00
Sanitary convention expenses,	272 15
Cyclostyle pen,	3 50
Total,	$3,000 28

The report was approved.

37. The Secretary reported that the number of written communications received by him during the year had been seventeen hundred and thirteen (1,713,) and the number sent by him nineteen hundred and ten (1,910). The total number of health circulars and forms distributed was twelve thousand seven hundred and eighty two (12,782). Of this number three thousand four hundred and seventy (3,470,) were distributed at Johnstown, and the immediate neighborhood in connection with the flood of May 31st.

The distribution of the Third Annual Report was then detailed showing twelve hundred and fifty one (1,251) copies to have been distributed up to the present time. The total number of compendiums of the law relating to public health and safety, distributed during the same period was one thousand and eighty two (1,082).

The additions to the library during the past year, were reported to be, of books, one hundred and sixteen (116), and of pamphlets, one hundred and thirty one (131).

The report was accepted.

The Board then, on motion, adjourned to meet at 8.30 P. M., at the Bolton House.

The Board reconvened at 8.30 P. M., when the Reports of Standing Committees being next in order, were presented as follows:—

Report of executive committee.

Dr. Pemberton Dudley, chairman, reported that this committee had held four meetings during the year, when accounts, amounting to $3000.28 and covering vouchers number 246 to 304 had been examined and approved.

The report was accepted.

Report of the committee on registration and vital statistics.

The Chairman, Dr. Lee, stated that he expected to have an interview with the Secretary of Internal Affairs to-morrow with regard to registration of marriages. The register of physicians was in the printer's hands.

The report was accepted.

Report of committee on preventable diseases, disinfection and supervision of travel and traffic.

Dr. J. F. Edwards, chairman, stated that he had a report in preparation. He solicited permission to place it in the printer's hands for publication in the Annual Report.

The statement was accepted, and the desired permission granted.

Report of the committee on public institutions, and school hygiene.

Dr. J. H. McClelland, chairman, stated that in plumbing, and ventilation regulation of schools, there was great improvement. Substantial progress in heating these buildings was also being shown.

The report was accepted and ordered to be published.

Report of the committee on adulterations, poisons, explosives and other special sources of danger to life and limb.

Dr. Pemberton Dudley, chairman, reported that as a result of the limited means at the disposal of the Board little or no expenditure of the funds had been deemed prudent, especially, as during the past year unusual demands had been made upon the resources of the Board. When the means and facilities at the Board's command would warrant it a more energetic policy would be pursued.

The report was accepted.

Reports of special committees came next in order.

Dr. J. F. Edwards, chairman of the committee appointed to inspect the towns in the flooded regions of the West Branch of the Susquehanna, reported that the committee had visited Jersey Shore, Tioga and Lawrenceville, all of which were found to be in fairly good state as regards sanitation, they having apparently recovered from the effects of the flood with the assistance rendered by the State, and their own energy; and the committee now recommends that the declaration declaring these places a nuisance be withdrawn.

The report was accepted, and the recommendation adopted.

The appointment of standing committees for the ensuing year being in order, the president decided that the committee should remain the same as last year, except that Dr. S. T. Davis be substituted for Dr.

George G. Groff, as chairman of the committee on sanitary legislation, and as a member of the committee on registration.

New Business.

Dr. J. H. McClelland having been accredited as a representative of the Board during his recent visit to Europe, presented a report on an examination of the mode of purification of the water-supply of Antwerp, Belgium. In investigating this system Dr. McClelland stated that he had received the cordial support and co-operation of Colonel Stewart, the American Consul at Antwerp, formerly of Pittsburgh, who introduced him to Mr. E. Devonshire, the chief engineer of the water-works. The process consisted in bringing the water into forcible contact with small pieces of iron, and was described at length.

The report was accepted, with the thanks of the Board, and referred for publication.

The Secretary then presented bills to the amount of $1,439.74, covering vouchers No. 281 to No. 304, inclusive, which had been audited and found correct by the executive committee.

They were read, and on motion, approved.

Mr. Howard Murphy moved that the meetings of the Board in Harrisburg be held, in future, at four o'clock in the afternoon.

It was carried.

On motion of Dr. P. Dudley it was resolved, that the President and Secretary be a committee to prepare a resolution expressing the regret of the Board at the severance of Dr. David Engelman's connection with it, and to forward such expression of regret to Dr. Engelman.

Dr. J. F. Edwards presented the report of himself and the Secretary as delegates to the recent annual meeting of the American Public Health Association in Brooklyn.

It was accepted.

The Board then, on motion, adjourned sine die.

BENJAMIN LEE, M. D.
Secretary.



PART II.

APPENDICES.



APPENDIX A.

REPORTS OF STANDING COMMITTEES.

I. Report of the Executive Committee, Pemberton Dudley, M. D., Chairman.
II. Report of the Committee on Public Institutions and School Hygiene, J. H. McClelland, M. D., Chairman.
III. Report of the Committee on Food Adulteration, etc., Pemberton Dudley, M. D. Chairman.
IV. Report of the Committee on Sanitary Legislation, Rules and Regulations, George G. Groff, M. D., Chairman.
V. Report of the Committee on Registration and Vital Statistics, Benjamin Lee, M. D., Chairman.
VI. Report of the Committee on Water Supply, Sewerage, Drainage, Topography and Mines, Howard Murphy, C. E., Chairman.

I—REPORT OF THE EXECUTIVE COMMITTEE.

By PEMBERTON DUDLEY, M. D., *Chairman.*

Since the last annual meeting of the Board, four regular meetings, and one special meeting have been held as follows:—

Regular meeting, Friday, November 30th, 1888.
Regular meeting, Wednesday, February 27th, 1889.
Regular meeting, Thursday, May 30th, 1889.
Regular meeting, Saturday, August 31st, 1889.
Special meeting, Wednesday, November 30th, 1889.

Vouchers—The following vouchers have been approved:—

No. 246, David Engelman, travelling expenses, ...	$11 50
No. 247, Howard Murphy, travelling expenses, ...	16 30
No. 248, Benjamin Lee, travelling expen	31 73
No. 249, G. G. Groff, travelling expense	8 59
No. 250, Clarence M. Busch, shipping re	60 00
No. 251, David Engelman travelling exp	26 00
No. 252, Pemberton Dudley, travelling e	11 80
No. 253, Wm. B. Atkinson, inspections, ...	56 00
No. 254, H. M. Alexander, vaccine virus, ...	2 50
No. 255, R. L. Sibbet, inspection, ...	35 00
No. 256, J. B. Lindsley, Trans-American Health Association, ...	5 00
No. 257, A. N. Bell, subscription Sanitari al, ...	4 00

No. 258, C. McIntire, Jr., inspection and postage,	53 68
No. 259, Republican Press Association, report on water pollution,	8 00
No. 260, Benjamin Lee, incidental expenses,	185 11
No. 261, Benjamin Lee, clerical expenses,	289 77
No. 262, Arthur A. Woods, vaccinations,	25 36
No. 263, J. L. Stewart, inspections,	61 80
No. 264, James R. Thompson, inspections,	29 05
No. 265, Wm. Leiser, Jr., inspections,	38 00
No. 266, Wm. B. Atkinson, preparing tables,	25 00
No. 267, Hart Cycle Co; World type-writer,	12 00
No. 268, Bivins, Myers & King, book cases,	35 00
No. 269, David Engelman, travelling expenses,	17 50
No. 270, J. H. McClelland, travelling expenses,	21 77
No. 271, Pemberton Dudley, travelling expenses,	7 95
No. 272, Howard Murphy, travelling expenses,	12 75
No. 273, G. G Groff, travelling expenses,	9 62
No. 274, Wm. Wood & Co, Smull's handbook,	2 50
No. 275, H. M. Alexander, vaccine points,	25 00
No. 276, H. M. Alexander, vaccine points,	7 50
No. 277, Henry Leffman, analysis,	15 00
No. 278, Benjamin Lee, current expenses,	391 01
No. 279, H. M. Alexander, vaccine points,	3 75
No. 280, H. M. Alexander, vaccine points,	15 00
No. 281, J. F. Edwards, travelling expenses,	83 58
No. 282, G. G. Groff, travelling expenses,	53 23
No. 283, Clarence M. Busch, state binder,	138 03
No. 284, C. McIntire, Jr., inspections,	56 93
No. 285, J. F. Edwards, travelling expenses,	64 22
No. 286, Henry Leffmann, travelling expenses,	25 14
No. 287, H. B. Baker, travelling expenses,	27 70
No. 288, J. M. Huff, printing programme,	11 00
No. 289, Joseph Eichbaum, printing programme,	24 85
No. 290, David Engelman, travelling expenses,	68 95
No. 291, Paul A. Hartmann, inspections,	11 00
No. 292, Penna, Cyclostyle Co., cyclostyle pen,	3 15
No. 293, Peter A. Schwartz, music for sanitary convention,	20 00
No. 294, R. L. Sibbet, travelling expenses,	24 40
No. 295, Pemberton Dudley, travelling expenses,	34 08
No. 296, Wm. Beale & Son, reporting and typewriting,	124 25
No. 297, Howard Murphy, travelling expenses,	28 89
No. 298, C. M. Cresson, analysis,	10 00
No. 299, Geo. G. Groff, travelling expenses,	10 74
No. 300, Bivins, Myers & King, storage,	12 00
No. 301, J. F. Edwards, travelling expenses,	12 00

No. 302, Benjamin Lee, incidental expenses,	535 60
No. 303, Geo. G. Groff, travelling expenses,	10 00
No. 304, R. L. Sibbet, inspections,	50 00
Total,	$3,000 28

II—REPORT OF THE COMMITTEE ON PUBLIC INSTITUTION, AND SCHOOL HYGIENE.

By Dr. J. H. McCLELLAND, *Chairman.*

Your committee has pleasure in reporting that in the past year many improvements in the construction of school and other public buildings have been noted.

Architects are directing much more intelligent attention to the sub ject of heating and ventilating public buildings, and city ordinances now make more scientific and sanitary plumbing a necessity than formerly. The supervision of plumbing in buildings by a municipal officer is bearing good fruit.

There is still much room for improvement however, and many of our schools, churches and other assembly rooms are lamentably deficient in the matter of supplying a sufficiency of pure wholesome air. In point of fact the air given our children to breathe in most of the schools is vile and poisonous and much sickness results therefrom. With churches the same is true. This state of things is the more deplorable, as with moderate expense in most cases, a sufficient quantity of wholesome air might be secured and delivered in most of these schools and assembly rooms. The great difficulty is, people, (especially architects) will not employ competent sanitary engineers to lay out the ventilation, plumbing and other sanitary arrangements of buildings, and it certainly would be to the advantage of all concerned if this was more generally done.

We trust at some future time to formulate some definite rules and directions which may be of service in this matter of ventilating school and other assembly rooms where large numbers are gathered, and where large quantities of air are consumed in brief periods of time.

III—REPORT OF THE COMMITTEE ON FOOD ADULTERATION.

By PEMBERTON DUDLEY, M, D., *Chairman.*

Your committee on food-adulteration, etc., again has to report that as a result of the limited means at the disposal of the Board, little or no expenditure of the funds, has been deemed prudent especially in

the presence of the unusual demands upon the Board's resources during the current year. Nor does it seem that any particular emergency has arisen requiring special action by this committee.

The only way in which any very useful work could have been done in this department of the Board's official business was by ferreting out and exposing such violations of our health-laws as appeared to escape the ordinary observation even of public sanitarians. It may well be questioned, we think, whether this Board cannot accomplish more in behalf of the public health in other directions: at the same time maintainng strict watchfulness over these portions of our public food-supply which present the greatest temptations to such forms of sophistication as are dangerous to health. Then, whenever the means and facilities at the Board's command may hereafter warrant it, a more energetic policy in this direction can at any time be adopted.

IV.—REPORT OF COMMITTEE ON SANITARY LEGISLATION, RULES AND REGULATIONS.

BY GEORGE G. GROFF. *Chairman.*

The committee on sanitary legislation, rules and regulations, begs leave respectfully to report:

That during the past year bills were presented to the Legislature upon the following subjects: viz:

An act to increase the limit of appropriation for the expenses of the Board from $5,000 to $10,000, annually. This act was passed.

An act to provide for the current expenses of the Board for two years.

This act was passed with amendments reducing the amount of appropriation.

An act to confer upon the Board certain powers to enable it to discharge the duties assigned to it by law.

This bill was lost.

An act to protect the purity of water supplies of cities and towns.

This act was lost.

An act to prevent the deposit of carcasses or other noxious matter in certain waters or on public roads or open lots.

This bill was lost.

An act to provide for the sanitary organization of the rural districts.

This bill was lost.

A communication was referred to the committee by the Board, requesting the Board to procure legislation forbidding undertakers from embalming a corpse before receiving a certificate from the attending physician that the death was from natural causes and not from poison. This suggestion has not yet been acted on.

The committee announces with some degree of satisfaction that it has succeeded in obtaining the appointment of standing committees on public health in both branches of the State legislature. It is hoped that this step will be an important aid toward securing a respectful hearing from that body in the future.

Two cases of issuing of false certificate of death in contagious diseases have been brought before the Board during the past year. The committee suggests that an effort should be made to have this crime recognized in the penal code of the State.

In the matter of sanitary rules and regulations, the chairman reports that at Johnstown, he assisted the Secretary of the Board in the preparation of seven health bulletins which were believed necessary to furnish the citizens of the devastated region and of the state with a knowledge of the exact state of the public health, in view of the alarming sensational reports of epidemic disease which were circulated in the press.

A circular of instructions was also issued to the deputy medical inspectors of the Board at Johnstown, one to all the physicians and hospitals in the Conemaugh valley, giving instructions and asking for daily reports. Three circulars of information were addressed to the people of Johnstown and vicinity, explaining the sanitary precautions to be adopted to prevent any outbreak of sickness. A circular to all the ministers of Johnstown asking them to give sanitary advice to their people. A blank form for a sanitary survey of Johnstown and neighboring buroughs was prepared and used for the purpose intended. A circular of information to the people of all the flooded districts of the state, giving advice as to sanitary measures was prepared and very widely distributed. Copies of all these circulars are appended to this report.

Your committee think that circulars of information do much good in times like the past summer, and recommend their continued use at all proper times. It is recommended also that all circulars issued by the Board be gotten up in the most attractive form possible, that those receiving them may feel a desire to preserve them for future use.

V.—REPORT OF THE COMMITTEE ON REGISTRATION AND VITAL STATISTICS.

By BENJAMIN LEE, M, D., *Chairman.*

The committee on registration and vital statistics reported a year since, that with the valuable assistance of the Secretary of Internal Affairs, Colonel Thomas J. Stewart and his energetic Deputy Secretary, Mr. Isaac B. Brown, the register of physicians of the Commonwealth was so nearly complete as to warrant its publication. It has

accordingly been placed in the printer's hands and forms a portion of the last annual report. An attempt made to correct certain inaccuracies in the matters of deaths and removals somewhat retarded the appearance of that report. With every effort many such errors still remain which in a future edition will be eliminated. The entire absence of sanitary organization throughout the state and consequent imperfection of the machinery for registration must be accepted in palliation. The committee desires it to be understood that the appearance of a name in the register is in no sense an endorsement of the individual. It simply records the fact of registration. There has been considerable laxity on the part of registration officers, and often a failure to appreciate the exact meaning of the requirements of the act. Many names of persons holding diplomas from those infamous *bogus* faculties which disgraced Philadelphia a few years since have been necessarily admitted. The committee has taken the precaution however to record in each instance the name of the institution from which the individual graduated and to append to the register a list of medical schools and colleges, with notes showing wherever a taint of fraudulence attaches.

The tables of comparison which accompany the register are extracted from the report of the Secretary of Internal Affairs for the year previous. They are based therefore upon a smaller number than actually appears. The proportional results however would not be altered. The value of this first register reaching from the inauguration of the system in 1881 to, in many counties, the end of the year 1888 is that it will form a broad and in the main correct basis for future work.

The registration of marriages has also been carried on at the central bureau but in a very fragmentary way, the finances of the Board being too limited to permit it to offer pecuniary compensation, to the registration clerks as it did in the case of physicians.

VI.—REPORT OF THE COMMITTEE ON WATER SUPPLY, DRAINAGE, SEWERAGE, TOPOGRAPHY AND MINES.

By HOWARD MURPHY, C. E., *Chairman.*

The committee on water supply, drainage, sewerage, topography and mines begs leave respectfully to report that during the past year it has had under consideration the subject of the drainage and sewerage of the city of Reading. The committee finds that the sewage matter is carefully treated by precipitation, and does not constitute a source of danger to the health of either Reading or Philadelphia at the present time. The best possible precautions are taken with regard to the emptying and disinfection of cess pools, in order to prevent pollution of the Schuylkill river.

The chairman has made a careful personal inspection of the alleged nuisance created by the drainage of the Devon Inn. While the committee considers the complaint to be well founded, it is convinced that the hotel proprietors are making an honest effort to purify their drainage and thus remedy the evil. The committee therefore suggests that further action be postponed until the engineer of the hotel, General Russel Thayer, has had time to mature his plans. When the system is in working order, the Board will be asked to inspect it.

APPENDIX B.

REPORTS OF INSPECTIONS.

I. Inspection of the Soldiers Orphan School at McAllisterville, Juniata county, by R. L. Sibbert, M.D., Medical Inspector.
   (*a*). Report.
   (*b*). Supplement.
   (*c*). Analysis of water.

II. Inspections in Lehigh county, by Charles McIntire, M.D., Medical Inspector.

III. Inspection at Eldred, McKean, county, by Spencer M. Free, M.D., Medical Inspector.

IV. Inspection at Chester, Delaware county, by William B. Atkinson, M. D., Medical Inspector.

V. Inspection at Berwick, Columbia county, by William Leiser, M. D., Medical Inspector.
   (*a*). Report.
   (*b*). Analysis of Water.

VI. Inspection at Gallitzin, Cambria county, by Charles B. Dudley, M. D., Medical Inspector.

VII. Inspection at Wallingford, Delaware county, by William B. Atkinson, M. D., Medical Inspector.

VIII. Inspection at Kingsley, Susquehanna county, by Lewis H. Taylor, M. D., Medical Inspector.

IX. Inspection at Canonsburg, Washington county, by J. R. Thompson, M. D., Medical Inspector.

X. Inspection at Middletown, Dauphin county, by Paul A. Hartman, M. D., Medical Inspector.

XI. Inspection at Dry Run, Lower Path Valley, Franklin county, by R. L. Sibbet, M. D., Medical Inspector.
   (*a*). Report.
   (*b*). Recommendations to Property Owners.

XII. Inspection at Philipsburg, Centre county, by George G. Groff, M. D., member of the Board.

XIII. Inspection at Kilkenny, Montgomery county, by William B. Atkinson, M. D., Medical Inspector.

XIV. Inspection of the Canal Bed in Indiana and Westmoreland counties, by H. F. Tomb, M. D., Deputy Medical Inspector.
   (*a*). Complaint.
   (*b*). Report.

XV. Inspection of Water Supply of Wilkes-Barre, Luzerne county, by Lewis H. Taylor, M. D., Medical Inspector.
   (*a*). Report.
   (*b*). Supplement.

XVI. Inspection at Hulmeville, Bucks county, by William B. Atkinson, M. D., Medical Inspector.

XVII. Inspection of the Rankin Tenement, at Braddock, Allegheny county, by J. R. Thompson, M. D., Medical Inspector.
XVIII. Inspection at Lock Haven, Clinton county, by George G. Groff, M. D., member of the Board.
XIX. Report on Complaintas to Sewage Discharge at Devon Inn, Chester county, by Howard Murphy, C. E., member of the Board.
XX. Report on Muncy Water Works Scheme by George G. Groff, M. D., member of the Board.
XXI. Inspection at Butcher's Run, Allegheny county, by Benjamin Lee, M. D., Secretary of the Board.
(*a*). Communication from Board of Health of Allegheny City.
(*b*). Report.
XXII. Inspection at Confluence, Somerset county, by C. L. Gummert, M. D., Medical Inspector.
XXIII. Inspection at Weissport, Carbon county, by Charles McIntire, M. D., Medical Inspector.
XXIV. Inspection of Trout Run, Lycoming county, by E. D. Payne, M. D., Medical Inspector.
XXV. Inspection at New Bethlehem, Clarion county, by Spencer M. Free, M. D., Medical Inspector.
XXVI. Inspection of the Method of Purification of Water at Antwerp, by J. H. Mc Clelland, M. D., Member of the Board.

I.—INSPECTION OF THE SOLDIERS' ORPHAN SCHOOL AT McALISTERVILLE, JUNIATA COUNTY.

By R. L. SIBBET, M. D., *Medical Inspector.*

DEAR SIR:—Your telegram of the twenty-second instant directing me to go immediately to the Soldiers Orphan School at McAlisterville, Juniata county, was received in the evening at 8 o'clock. The next morning I set out with authority which I received by mail to make special inquiry as to the cause of typhoid or other fever said to be prevailing in the school and to report.

As you gave, March 12th 1886, to his Excellency Robert E. Pattison, Governor of Pennsylvania, and to the public in the published reports of the Board, a very full account of this institution, I need not, except as it may appear necessary, refer to the location and construction of the buildings, capacity and ventilation of the dormitories; capacity ventilation and lighting of the school rooms; condition, character and amount of bedding; condition character and amount of body clothing; quality and quantity of food supply; number of hours devoted to study, sleep and exercise; character and quality of water supply; the analysis of well-water by Dr. Groff; mode of drainage and condition and location of privies.

On approaching McAlisterville and the institution, it became apparent to me that both are unfavorably situated as regards health. A small stream of water which requires a bridge twenty or twenty-five feet long flows along the north side of the village, and the school build-

ings are located on slightly rising ground about five hundred feet north of the brook. Westward and northward from the institution are lands slightly rising until a series of hills is reached, and on the south is a high hill not more than half a mile distant. These lands, twenty acres of which belong to the institution, consist of a loose readily leaching clay. The impression left upon the mind is that this district of country might produce malarial fevers and diphtheria, unless unusual precautions are taken.

I was courteously received and welcomed by the principal, Mr. J. M. Sherwood, and his estimable lady. My first inquiry was concerning statistics and history. There are one hundred and fourteen boys in the institution, seventy-nine girls and fifteen employés, making in all two hundred and eight. The cases of fever were given to me in the following order, the dates indicating the day on which they took their beds:

October 24th., Annie W., aged 15 years convalescing slowly, with left leg œdematous from the knee to the toes.

October 29th., Ella W. (employe), aged 22 years, convalescing, but in bed.

October 29th, Virgil B., aged 16 years, died November 7th.

November 1st., Charles A. W. (employe), aged 25 years, convalescing, but in bed.

November 1st, Laurina A., aged 15 years, died November 19th.

November 1st, Pricilla U., aged 15 years, convalescing.

November 2d, Susan B., aged 13 years, convalescing.

November 2d, Thomas Mc., aged 10 years, convalescing.

November 2d, Arthur E., aged 10 years, convalescing.

November 2d, Henry S., aged 11 years, convalescing, but has been very ill.

November 2d, Edward K., aged 13 years, convalescing.

November 3d, Bertie L., aged 9 years, convalescing.

November 3d, Edward G., aged 11 years, has been very ill, but is convalescing.

November 3d, Thomas A., aged 12 years, convalescing.

November 3d, Hugh L., aged 14 years, convalescing.

November 30th, Charles B., aged 14 years, is yet very ill.

November 3d, Murry D., aged 14 years, convalescing.

November 3d, Lottie C., aged 15 years, convalescing.

November 3d, Alice Mc., aged 13 years, convalescing.

November 4th, Mary M., aged 15 years, convalescing.

November 4th, Clara H., aged 15 years, convalescing.

November 5th, Lottie W., aged 10 years, convalescing.

November 6th, Frank G., aged 15 years, convalescing.

November 6th, Carl M., aged 15 years, convalescing.

November 7th, Mary S., aged 25 years (employe), mild case—is well.

November 8th, Ettie H. F., aged 15 years, convalescing.

November 8th, William B., aged 10 years, convalescing.
November 8th, William C., aged 11 years, doing well.
November 9th, Ellen S., aged 19 years (employé), convalescing.
November 10th, Willie L., aged 12 years, convalescing.
November 10th, Frank S., aged 14 years, convalescing.
November 14th, Fannie G., aged 14 years, convalescing.
November 16th, Joseph N., aged 9 years, doing well.
November 16th, David F., aged 13 years, convalescing.
November 16th, Clara E., aged 14 years, mild case.
November 17th, Alfred B., aged 12 years, mild case.
November 21st, Maggie B., aged 12 years, mild case.
November 24th, David L., aged 10 years, mild case.
November 24th, John M., aged 9 years, mild case.

This in brief is the history of these forty cases, as given by the principal without knowing what use I might make of it. At four o'clock Dr. Hoopes, who is the attending physician, arrived, and I was introduced to him. I expressed a desire to see some of the worst cases before night came, and he kindly gave me all the opportunities I desired to satisfy myself as to the character of the endemic. The principal then took me to the two wells, the two cisterns and the two privies on the premises.

The first well is about ten feet from the northwest corner of the new building, on the east side of the public road It is about twenty-five feet deep and is well covered. The water is drawn from it by a chain pump. It is cool, clear, without odor and is pleasant to the taste. Dr., Groff analyzed it two years ago and pronounced it good. There are only two ways by which this well could be contaminated; first, by surface water finding its way from the fields along slate rocks or an impervious stratum of clay, which is possible, but improbable. The second way is, that by its close proximity to the washroom in the basement of this building, foul water might enter. The entire basement of this building is used as a girls' play room, girls' lavatory and laundry, There is no cooking done in this building. Recently a new board floor was laid in the washroom which is about two feet and a half below the surface of the ground. The wash water is thrown into an open barrel and conveyed from it by an iron pipe fifty feet long, and then by a wooden pipe, under ground to a point in the public road about one hundred and fifty feet from the building, where it freely escapes. It is difficult to see how the water in this well could be contaminated from this basement.

The first cistern is about fifty feet from this well and about twenty-five feet from the building. The water in it is collected from the roof and it is only used for washing purposes.

The first privy, used exclusively by females, consists of a cheap board house about sixteen feet long by seven feet deep. Under it is a long open, wooden box, sunk in the ground about a foot and a half. Con-

nected with the end of it is a trough made of boards sunk in the ground, which carries the fluid contents fifty feet or more into the field.

The second well is about ten feet from the south-west corner of the kitchen, attached to the old building on the west side of the public road. The ground here is about three feet lower than that around the new building. The well is about twenty feet deep; and it is said, that it cannot be pumped dry. The water is drawn from it by a chain pump. The waste water is carried away by a board trough sunk, in the ground, forty or fifty feet long. The old building which was built for the purposes of an academy or boarding school is stone and brick. The greater part of the basement of it is used as a dining hall for the whole school. A small part is used for a cellar and pantry. In the latter, potatoes, bread, coffee, sugar, etc., are kept, and apparently in good condition. The rear building referred to is frame and weather boarded, the basement of which is used as a kitchen and bake-house, where all the cooking of the institution is done.

The second cistern is under the floor of the kitchen, the water of which is not used for cooking and drinking purposes, but for the purpose of washing dishes. It has in it an ordinary lever pump. The water in it is clear and without odor. The dish water is emptied into the open drain referred to and carried in a trench to the brook. The garbage is fed at once to the pigs.

The second privy, used by the boys is about three hundred feet from the second well, and four hundred feet from the first well. It is built of boards in much the same style as the first one, but it has no drain. I cannot believe that this privy has a connection with either of the wells and hence that they are polluted by it. I drank of the water of both wells and I cannot say that it had an unpleasant odor or taste. I leave the question of analysing the water of this old well to be answered by yourself.

But, in my opinion, there is a much more direct way of accounting for the origin and continuance of this *endemic*. On the 22d., of October these privies, which had become foul, were cleaned out, and no special care was taken to disinfect them. An old man, not connected with the institution came and removed their contents from the premises. On the 24th, Annie W., took her bed and was very ill. She is improving slowly, but within the last week she has an œdematous leg. On the 27th, Miss Ella W., an employé, lodging also in the new building took her bed. She was very ill, is improving, but is unable to sit up. On the 29th, Virgil B., lodging in the old building, and associating with the other boys, took his bed, and in nine days died. On the first of November Laurina A., lodging in the new building, and associating with the girls, took her bed, and in nineteen days died. On the same day that Laurina took sick, Mr. Charles A. W., an employé lodging in the old building, took his bed; was very ill, but is

improving slowly. He says that on the 22d., of October he spent several hours, at the first named privy, putting it in order, and that it was a very offensive job. Two days afterwards he did not feel well, and grew worse every day until he was obliged to take his bed. On the same day, November 1st., Priscilla U., took her bed—was very ill, but is now improving.

Here we have, during the first week of this epidemic, six patients, all of them with the well marked symptoms of typhoid fever and two of them die. They could not have given the disease to each other, for they had but little, if any association with each other. Two of them were employés, lodging in different buildings, one a male the other a female. Three of the students were girls of the same age (15 years) and they lodged in the new building. The fourth was a boy sixteen years old, who lodged in the old building. We may allow that they all came into the same dining hall for several days and that they all entered the same chapel during this time, but we cannot suppose that any one of the six gave the disease to the others by association. We may allow too, that they all drank of the water of the wells, but we cannot infer that the water was the cause of their sickness, for this would imply that the water became suddenly foul. They had all been drinking it for months before, without a single case of fever in the institution. Besides the water had been analysed and pronounced good, and had been used for many years without causing fever. But these patients were all suddenly exposed to the foul odors of the recently uncovered excreta of the privies, and they as suddenly became sick with the same disease.

During the next week, including November 8th, twenty-three others took their beds with the same symptoms, but they were not so grave. Thirteen were boys, nine were girls and Miss Mary S. an employé. Some of them have been quite ill, but all are convalescing. Their sickness is possibly due, in part, to association with each other, the males lodging in the old building and the females in the new one; but all were exposed to the odors of the privies from nine to fifteen days. In the meantime, however, the Principal ordered unslacked lime to be used freely in the privies. He also ordered drinking water to be brought from a well in the village, and that no one use the water of the wells as a beverage.

During the next sixteen days, including November 24th, twelve others were added to the list of the sick with the same group of symptoms, though somewhat milder. Six are boys and six are girls. Their sickness is possibly wholly due to association with each other; and from the abundance of lime used in the privies, we may infer that the original cause of the epidemic has entirely disappeared.

As a matter of scientific interest it may be proper to state, that Annie W. the first case, was complaining of not being well on the day

the privies were cleaned out. This would rather establish the theory that the specific disease with which she is still suffering had its origin in the first named privy where Mr. Charles A. W. on the same day inhaled the germs of disease.

But it is said that Annie W. was absent from the institution on the 25th, 26th and 27th of September. During these three days she visited her grandmother in Port Royal, and slept in her house where there had been no sickness. It is not known how she could have brought the disease into the school; and besides nearly a month had elapsed from the time of her return.

The conclusion therefore is, that this epidemic of typhoid fever had its origin in the removal of the excreta from the two privies, without sufficient precautions in immediate use of germicides and disinfectants.

As to the character of the disease, I need only state that I agree with Dr. Hoopes the attending physician, that it has been typhoid fever, and is now assuming the form of continued fever.

The question which remains to be answered is the practical one: What means may be used to prevent the continuance of the disease in the institution. The buildings are badly constructed for the purpose of a school of any size. They are now crowded. At no time should there be admitted into them more than seventy-five boys and seventy-five girls. Moreover the floors, especially in the older building are bad, and as a consequence the halls and rooms cannot be easily disinfected.

I had spent the forenoon of Saturday the 24th inst. in company with the principal and attending physician, and had made a more careful inspection of the building and had also seen all of the sick. At noon the Hon. John M. Greer, Inspector of the Soldiers' Orphans Schools reached the institution, and after a conference with him, I hastily prepared instructions which I submitted to him, and he joined me in urging an immediate compliance with them. A copy of these you have doubtless received; a summary of which may here be given:

(1) That the sick and convalescent be entirely separated from the other students and employes of the institution, until they have been bathed and fresh clothing is given to them.

(2) That no one be permitted to enter the rooms of the sick and convalescent, but the physician, the nurses and immediate relations, (the latter to remain only fifteen minutes.)

(3) That a solution of the chloride of lime (one ounce to a gallon of water), be furnished to the nurses, to be used in the chambers and bed-pans after every evacuation from the bowels.

(4) That the excreta of the sick rooms be carefully removed from the buildings and buried in a field distant from the institution.

(5) That the solution of the chloride of lime be used on the floors of the sick roms with a mop every day.

(6) That the body and bed-clothing of the sick and convalescent be

carefully rolled up, taken immediately to the wash room and placed in hot water, and as soon as possible washed.

(7) That the straw in the bed ticks be immediately burned and the ticks washed before being used again.

(8) That as soon as the dormitories can be spared (which is nearly impossible on account of the number of students) they be thoroughly disinfected.

(9) That until other privies are constructed on an improved plan, the contents of the present ones be carefully removed every two months in winter and every month in summer, and that they be thoroughly washed and flooded with a strong solution of the chloride of lime, or copperas, before any one enters them.

(10) That until further orders are given water from other wells be used as a beverage.

SUPPLEMENT.

CARLISLE, PA., *January* 29, 1889.

DR. BENJ. LEE:

DEAR SIR:—Copies of the analysis of the drinking water of the McAlisterville Orphan School sent to me, a letter from the principal, and several letters from the physician recently received, enabled me to prepare a brief supplement to my report of November 26th ult.

We begin with an abbreviated statement of facts as given by Dr. W. H. Hoopes. Two new cases appeared after my visit—one a girl 14 years old, and the other a mother who came to nurse her son; both mild. There have been in all 42 cases; 37 children, 4 employes and 1 mother; 2 deaths. The forty are well, except two who are convalescing. The first case, Annie W. has not yet fully recovered.

The longest duration of sickness was 35 days; the shortest 4 days: average duration 17 days. The highest temperature 105° F.; nose bleeding frequent; rose-colored spots on some; diarrhœa common, but not difficult to control; gurgling sound in right illiac region in severe cases; no hemorrhage from bowels; tympanitic condition of abdomen in most cases; muttering and delirium in all severe cases. My own observation confirms these statements. Although the attending physician has not kept a daily account of his work so as to give the history of cases in full, I may state that I was very favorably impressed with his careful and judicious treatment, especially in not making use of doubtful remedies.

The principal, Mr. J. M. Sherwood, writes under date of December 30th. All are attending to their school duties, but three. We have not used the water of the wells, since the 6th of November. To the following questions he has given the following answers. When was the new floor laid in the laundry? April 30th 1888. Did the wash-water run through the old floor? It had leaked some in two places. Do you

suspect that the wash-water runs through the new floor? No; when the old floor was taken out the loose earth was removed, leaving the ground dry and hard. Did you ever see the iron pipe and the wooden in the earth uncovered? Yes; they connect about twenty-five feet from the laundry.

It will be noticed that the first sample of water analysed was taken from the second well near the southwest corner of the old academy, and that the second sample analysed was taken from the first well near the northwest corner of the new building.

How has the water of these wells become contaminated? The privies are too far distant to have any connection with them. All the facts show that the first well has not been contaminated by the wash-water of the laundry. The water taken from it, nevertheless, contains more "albumenoid matter" than the water of the second well, and less of all other dangerous ingredients.

The second well is not so favorably located. It is dug in ground three or four feet lower than the first one. It is near the kitchen. The wash water from it is carried past the well, and thrown into a wooden trough which conveys it into a field a considerable distance. We may easily suppose that a certain amount of waste water and garbage have been dropped near this well, though it is said, great care has been exercised in this respect.

We are therefore forced to the conclusion that the contamination of these wells is from the surface. The soil of this region permits water to percolate through it in rainy seasons, and there was doubtless, a greater amount of rain-fall last summer than usual. This will possibly account for all the impurities Dr. Cresson has found in the samples of water sent to him.

But we have now reached a point in our inquiry at which another cause for the fever appears,—a cause too, which could not be easily ignored at the time of my visit. On the 22d of October, the excrement of the privies referred to was removed. The whole school was more or less exposed to whatever danger there was from this source. The synchronism here observed renders it difficult to determine with certainty which was the more active cause. We cannot tell how much foul water taken into the stomach will produce typhoid fever, nor can we tell how much foul atmosphere taken into the lungs will produce it. A single draught of foul water may be sufficient; a single draught of foul atmosphere may likewise be sufficient.

In this epidemic of fever there appears to be two causes of the disease. Annie W. who took her bed on the 24th of October was doubtless exposed to both, but it is difficult, with our knowledge of the period of incubation of typhoid fever, to connect her illness with the inhalation of germs. Her sickness must therefore be attributed to the impurities in the water of these wells.

On the 27th, Ella W., (employé) took her bed. Here we might infer that the contagion came from the recently cleaned out privy; but five days are scarcely sufficient for the incubation; and for the same reason we cannot infer that she took the disease from Annie W.

Virgil B. took his bed on the 29th. He lived in another building, and could not have taken the disease from either of the other cases. He no doubt drank the water of the well at the kitchen and was exposed to the foul atmosphere of one privy at least. There has therefor been a double cause for his illness. He died November 7th.

On the 1st of November Charles A. W. (employé), took his bed. He had assisted in cleaning the privies and was in good health. The next day he felt badly and continued to feel worse every day. Here was the usual period of incubation (9 days) and it is not unfair to infer that his fever came from inhalation though he possibly drank the water of both wells.

On the same day and the next two days, fifteen others took their beds. Did these fifteen take the disease from the four previous cases? Not likely. Twelve days had now elapsed from the cleaning of the privies, and there was full time for the incubation from this cause.

Nineteen cases of typhoid fever in ten days would indicate very plainly a sudden cause. The cleaning of the privies on the 22d of October would furnish a sudden cause; and it should be remembered, that surface privies, such as these, are the worst kind; and to remove their contents during the months of July, August, September and October is certainly attended with danger. The earth is warmer during these months and germs are are more likely to multiply. The same could not be said of privies eight or ten feet deep.

But how about the sudden contamination of the water in the wells? Was there a heavy rain about this time which carried decomposing animal and vegetable matter into the wells? We have no positive information on this point, and yet there is no other way to account for the sudden contamination of the water. Germs do not originate or multiply in wells twenty feet deep. The temperature is too low. To account for the sudden pollution of both wells there should have been a freshet about the 15th of October. At this time the offending vegetable and animal matter should have been carried into the wells, in order to give sufficient time for the incubation of the disease. If we had more information, as to heavy rains at this period, we would be much more inclined to trace the epidemic in this school to the use of the water of these wells.

The two possible causes of typhoid fever in this institution have thus been presented. It has not seemed proper to make an apology for these large surface privies on the premises. Sanitarians of the army will fully appreciate this statement. As to the wells we regret to state that they are too near the buildings. A well should be at least a hundred

feet away from a barnyard, a chicken yard, a hog-pen, a privy, a wash-house, or even a kitchen, especially if the soil is porous.

We have already indicated what should be done in the case of the privies. It remains for us to state, that if the school is to be continued and if the water of the wells is to be used for drinking purposes, the soil around the wells, to the extent at least of ten feet, should be removed to the depth of two feet, and that impervious clay should be substituted and packed down; and that drains should be made, so as to turn all surface water away from the wells.

All of which is respectfully submitted.

R. L. SIBBET,
Medical Inspector, Cumberland District.

(c.) Analysis of Water.

Analysis of Water from Soldiers' Orphans' School, McAlisterville, Pa.—Analysis made January 2 and 9, 1889, by Charles M. Cresson, M. D. Sample received January 2, 1889. *Amount of sample, one U. S. G. Condition of sample, clear. Reaction, neutral.

ANALYSIS No. 5,475.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	1.1650	166.362	19.968
Ammonia, free (NH_3),	0.0016	0.228	0.027
Ammonia, albumenoid,	0.0160	2.280	0.274
Nitrogen from nitrates,	0.0200	2.856	0.343
Nitrogen, from nitrites,	Trace.	Trace.	Trace.

Analysis No. 5,475.—This water is not of good quality although it is just within the limits of contamination which will permit its use for a drinking water. Should any enteric disorders appear then the use of this water should be prohibited. But with those who are free from irritations of the bowels, I do not consider its use would be dangerous.

CHARLES M. CRESSON, M. D.

*One U. S. gallon contains 231 cubic inches, or 8·332698 pounds.

II.—INSPECTION IN LEHIGH COUNTY.

By CHARLES McINTIRE M. D., *Medical Inspector.*

EASTON, PA., 20 '88.

BENJAMIN LEE, M. D., *Secretary State Board of Health.*

DEAR SIR:—I have just returned from a visit to Lehigh county. My first stopping place was Emaus, the first station on the East Penn R. R. six miles from Allentown. I called on the two physicians living there. Dr. Diller had the first case of which I have had any report thus far. It occurred in the winter, probably in January, 1888, he has no record of the case, but will make inquiry and report; it resulted fatally. Including this case he has had about twenty-four cases, with three deaths; five of these cases and two of the deaths being since December 13. The next case of which I have record in Emaus, was attacked on May the 27th, in the practice of Dr. Erdman of Macungie. The other physician living in Emaus, Dr. Schlough, had no diphtheria until the 25th of June, he has had in all forty-one cases with six deaths, one case now under treatment. Dr. Erdman, of the next town also has a practice in Emaus. He reported up to November 27th ten cases and three deaths in, or in the immediate vicinity of Emaus. This makes seventy-five cases and eleven deaths for this Borough or its outskirts for the present year. The Borough authorities have made no attempt to check the progress of the disease in any way. The town is very pleasantly situated with a fair natural surface drainage; the houses are built back from the street, with the yards running back to a sixteen to twenty foot alley, in which the kitchen refuse is pretty generally thrown, with no regulations about removing it; there is no precaution enforced about isolating the patient, keeping the rest of the family from school, privacy of burial, or through disinfection. I do not say that it is not done to some extent: the physicians advise it, but it rests with the people to follow the advice or not. In some of the funerals, the coffin was opened at the church, according to the usual custom. Not being able to see the chief burgess, I have addressed him a communication urging the immediate action of the borough authorities, and sending him a copy of the model ordinance, also circulars on diphtheria, and contagious diseases. I did not stop at Macungie. Dr. Erdman has reported in Macungie seventeen cases and four deaths, and in a place he calls Upper Milford, four cases with one death, none of these later than November 27th, since which time I have not heard from him: rumor says there are additional cases.

At Breinigsville, there were some cases. There is no physician living in this village, and I could obtain no clue as to which of three or four

neighboring doctors might be in charge. I obtained definite knowledge of one family in which there were six cases and three deaths, another with seven cases and one death, some of the cases are still under treatment.

At Alburtis I had a conference with Dr. Mohr, he reports forty-eight cases, the first being on October 17th, with eleven deaths, and four or five cases under treatment.

This amounts in all to at least one hundred and fifty seven cases and thirty-one deaths during the year in this section of Lehigh county. I have as yet no theory to advance as to its origin. There is no trouble to see how it spread: the only surprise is that it has not spread more.

The simple sanitary precautions of isolation and disinfection ought to be intelligently enforced. Until this is done, there will be a prevalence of this disease in these neighborhoods, as well as the menace of danger to a wide circle.

I should state in regard to Alburtis, that it is not incorporated, and that the disease was confined to the village, not extending into the surrounding country.

Very Respectfully,

CHARLES McINTIRE, Jr.,
Medical Inspector, Lehigh District.

BENJAMIN LEE, M. D., *Secretary, etc.*

DEAR SIR:- Dr. M. S. Richard, of Maxatawny, near Breinigsville, where I visited last week, and who is physician to one of the families in Breinigsville, writes yesterday; that his first cases appeared in Rothrocksville on or about September 1st. Seven cases with three deaths. He has still a few mild cases there. At present "it is raging seriously in the village of Newtown, Lehigh county, commencing on or about December 1st.

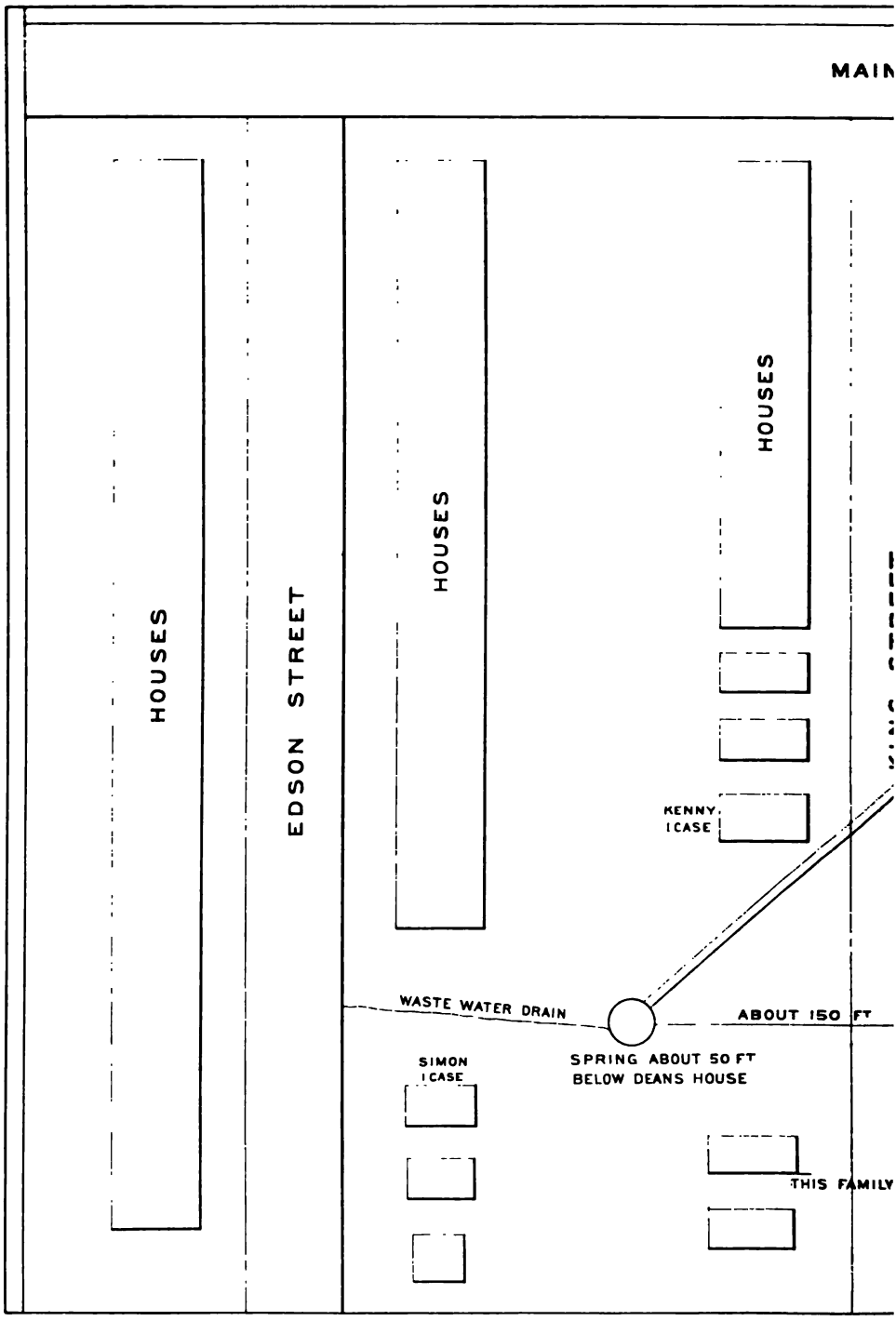
He reports about thirty cases with six deaths.

In the village of Farmington, the disease appeared on the 21st. instant: the case a boy of fifteen: he represents it as of a malignant type. This makes fifty-one deaths of which I have a record.

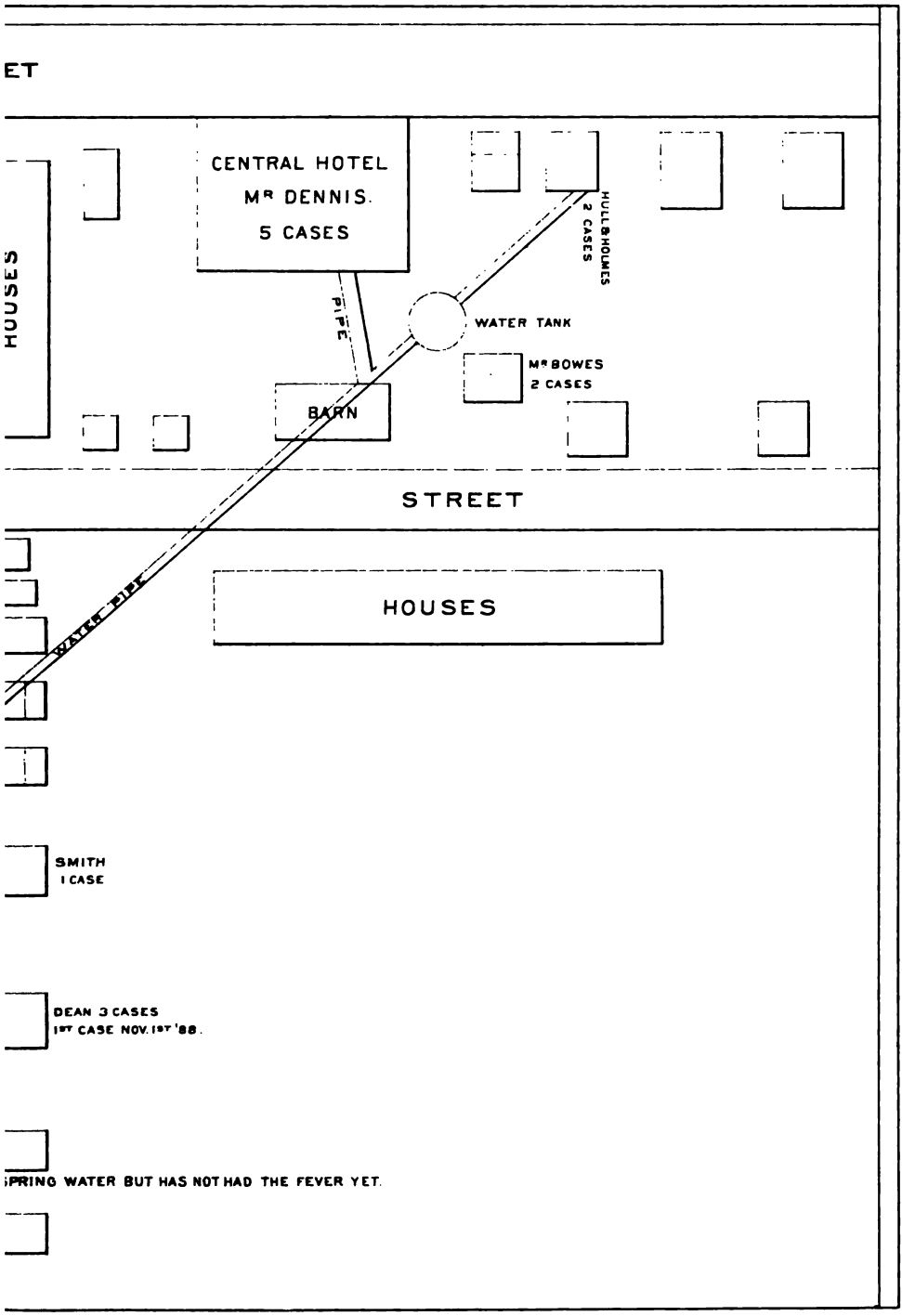
Very truly yours,

CHARLES McINTIRE, Jr.,
Medical Inspector.

MAP OF ELDRED PA. SHOWING SO



OF TYPHOIDAL POLLUTION OF WATER.



III.—INSPECTION AT ELDRED, McKEAN COUNTY.

By SPENCER M. FREE, M. D., *Medical Inspector.*

DR. BENJAMIN LEE, *Secretary State Board of Health.*

DEAR SIR: Visited Eldred, McKean county, yesterday. Reached there at 6.30 P. M. Attended a meeting of the council and physicians at 8 P. M. Got a history of the epidemic of typhoid fever now prevailing there, also that of several cases. This morning I examined the patients, the houses, the water supply, etc., and beg leave to report as follows:

The diagnosis is correct. There have occurred fifteen cases up to the present time.

About November 1st, 1888, there came to Mr. Dean's, a young man ill with the disease. By referring to the accompanying plot it will be seen that about one hundred and fifty feet from Mr. Dean's water closet and about fifty feet below it (in elevation) there is a spring, used by some of the neighbors. It is open, and pails, etc., are dipped into it to obtain water. A pipe runs from the spring to the Central hotel, emptying into a tank outside of the hotel by one branch of pipe, and by another carried through the hotel.

By referring to the plot the location of each house can be seen.

No case has occurred in any family not using the spring water.

The spring comes out on a bed of hard pan and I am told that the soil above this is loam, gravel and clay.

The second case developed about December 1st, and the other cases at various times since then. The history points very clearly to the spring as the source of contamination, having been infected by the discharges from the first case at Dean's.

The family was enjoined to be careful and to disinfect all discharges, but I have no idea that they did as directed. Families in the same neighborhood, as seen on plot, not using the spring water are not infected. Every family but one using the water is infected.

At the Central hotel (Mr. Dean's) there have been five (5) cases. They claim to use the water for no purpose but scrubbing, dish-washing and laundry purposes, also for the wash pitchers throughout the hotel. In the general office on the first floor are some stationary wash-stands supplied by this water. On a stand beside these wash-stands there is a water cooler, they say, always filled with drinking water from a well. When all circumstances are considered, I very much doubt whether the spring water is *never* used for drinking purposes. This variety being constantly "on tap" while the other (the well water) requires pumping and must even then be obtained from the cellar, predisposes one to use the first especially if in a hurry.

What shall be done? The best thing of course is to dig out the spring and fill it up with cinders and stones so that it cannot be used by any

one. But Mr. Dennis is so anxious to get the use of the water, and as the disease is not a contagious one, I have thought that possibly it might do to let him use it if he dug out the spring, walled it up in cement and conducted the overflow through an underground pipe to the gutter of the street below—Edson street.

The council promises to organize at once according to the "model ordinance" and agrees to carry out any directions that you may give concerning the spring, or to see that they are carried out by Mr. Dennis if you allow him to retain use of the water.

Yours respectfully,

SPENCER M. FREE,

Medical Inspector, Western Slope District.

February 7th, Dr. Free reports nine additional cases.

IV.—INSPECTION AT CHESTER, DELAWARE COUNTY.

By WILLIAM B. ATKINSON, M. D., *Medical Inspector.*

In obedience to your instructions on January 31st, I went to Chester and inspected the premises of Robert King in that township. They are located about one mile from the depot and one fourth of a mile beyond the suburbs of the town, although the line comes directly along side of his pig-pen. He has 34 small pigs for which he says that he is unable to get sufficient slop. At the time of my visit there were three barrels half full of slop. He uses the manure for his own ground and assured me that he cleans up every day. There was probably four cart loads of stuff that should be removed, which he informed me he was that day about to haul out and put on his field. The pens were not raised from the ground and hence not susceptible of being cleaned beneath. He uses no lime or disinfectant, although I could not say that the place was in a filthy condition.

He promised me that he would at once remove all the accumulations and put the ground in a cleanly state.

My recommendation is to give him time to do this and then if not satisfactory that he be formally notified to do so. He had found so much difficulty in procuring enough slop that he was contemplating the abandonment of his piggery.

Respectfully submitted.

WILLIAM B. ATKINSON,

Delaware District.

V.—INSPECTION AT BERWICK, COLUMBIA COUNTY.

By WILLIAM LEISER, JR., M. D., *Medical Inspector.*

DR. BENJAMIN LEE, *Secretary State Board of Health.*

DEAR SIR: As directed I visited Berwick, Columbia county, Pennsyl-

vania, and inspected the ice pond of Mr. Arch Averill. This pond covers an area of nearly half an acre. is located within the limits of the borough of Berwick, and is formed by damming a small stream of water which has its origin in five springs, the nearest one about one mile distantfrom the pond,and the furthest one about three miles away.

At the present time the pond has considerable overflow, regulated by a flood-gate, but in dry weather the stream is dry and it at all times catches the surface water from the agricultural country through which it runs and which it drains. The fertilizers used on the land thus drained are barnyard manure, commercial "phosphates" and excrement taken from cess-pools. The farmer using cess-pool manure says that he uses it only on the land having a slope away from the stream. There is a slaughter-house 20 feet distant from the pond, the offal of which is removed about once a year, and there are also two cess-pools, one about ten feet and the other about twenty feet away from the pond.

The stream that feeds the pond also passes through a barnyard about one hundred and fifty yards above the pond, the manure pile in this yard being made up from the excrement of fowls, cows, horses, pigs and probably the overflow of one cess-pool. The soil through which this stream runs is of a gravelly character. The pond has a mud bottom necessary to make it water-tight.

There has been no suspected typhoid fever or other infectious disease in the country drained by this stream, so far as I could learn. There has been typhoid fever in the town. If a case were to occur in the house through the barnyard of which this stream runs, the ice-pond would almost certainly become infected. The owner says that he will change the course of the stream at this point, running it about twenty feet away from the barnyard; but the close proximity of this barnyard would still be objectionable, as also that of the slaughter-house and cess-pools above mentioned.

The preliminary examination of the water shows it to contain considerable organic matter. Dr. Cresson has examined the ice and reports it good, and he will analyze the water soon.

I have made as yet no exhaustive qualitative or quantitative analysis of the water, but independent of a chemical analysis would regard the ice as improper for use for domestic purposes.

If the pond were removed above the barnyard, one hundred and fifty yards from the present site, the ice would be fair, but would be better still if taken directly from one of the springs from which the stream has its source.

Respectfully submitted,

WILLIAM LEISER, Jr.,

Medical Inspector, Northumberland District.

(b) Analysis of Water.

Analysis of Water from Ice from Averill Pond, Jackson & Woodin Manufacturing Co., Berwick, Pa.—Analysis made February 8–12, 1889, by Charles M. Cresson, M. D. Sample received February 8, 1889. *Amount of sample.....U. S. G. Condition of sample, clear. Reaction, neutral.

ANALYSIS No. 5,541.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine, in combination,	0.2910	41.555	4.988
Ammonia, free (NH_3),	None.	None.	None.
Ammonia, albumenoid,	0.0048	0.686	0.083
Nitrogen from nitrates and nitrites,	0.0200	2.856	0.343

Analysis No. 5,541.—This water is in very good condition for household use.

CHARLES M. CRESSON, M. D.

Analysis of Water from Averill Pond, Jackson & Woodin Manufacturing Co., Berwick, Pa.—Analysis made February 7–12, 1889, by Charles M. Cresson. Sample received February 7, 1889. *Amount of sample, ...U. S. G. Condition of sample, clear. Reaction, faintly alkaline.

ANALYSIS No. 5,539.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine, in combination,	0.4580	65.402	7.850
Ammonia, free (NH_3),	0.0064	0.914	0.110
Ammonia, albumenoid,	0.0096	1.317	0.165
Nitrogen from nitrates and nitrites,	0.0200	2.856	0.343

Analysis No. 5,539. This water is in fair condition for household use.

CHARLES M. CRESSON, M. D.

Analysis of Water from Ice, Petty Pond, Jackson & Woodin Manufacturing Co., Berwick, Pa.—Analysis made February 8–12, 1889, by Charles M. Cresson, M. D. Sample received, February 8, 1889. *Amount of sample, ... U. S. G. Condition of sample, clear. Reaction, alkaline.

*One U. S. gallon contains 231 cubic inches, or 8·332698 pounds.

ANALYSIS No. 5,542.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	0.4580	65.402	7.850
Ammonia, free (NH_3),	0.0176	2.513	0.301
Ammonia, albumenoid,	0.0320	4.570	0.548
Nitrogen from nitrates,	0.1800	25.704	3.085

Analysis No. 5,542.—This water is in very bad condition, unfit for household use, and in a very dangerous condition as regards the carriage of disease. Its use should be prohibited absolutely for household or drinking purposes,

CHARLES M. CRESSON M. D.

The microscope shows the presence of active animal and vegetable organisms which indicate the presence of hurtful organic matter in solution.

Analysis of Water from Miller Dam, Jackson & Woodin Manufacturing Co.,—Analysis made February 18–25, 1889, by Charles M. Cresson, M. D. Sample received February 18, 1889. * Amount of sample, ... U. S. G. Condition of Sample, clear. Raction, neutral.

ANALYSIS No. 5,560.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	0.6240	89.107	10.695
Ammonia, free (NH_3),	0.0048	0.686	0.083
Ammonia, albumenoid,	0.0208	2.971	0 367
Nitrogen from nitrates,	0.0200	2.856	0.333

Analysis No. 5,560.—This water is highly contaminated with decaying matter, probably of vegetable origin, with a small amount of drainage from animal matter. It is unfit for use in its present condition.

Microscopic examination fails to show the presence of other than vegetable matter. If this water has been taken either during or just after a freshet or heavy rainfall, it will be fairer to re-examine it when the flow shall have become normal.

CHARLES M. CRESSON, M. D.

* One U. S. gallon contains 231 cubic inches, or 8·332698 pounds.

VI.—REPORT OF AN INSPECTION AT GALLITZIN, CAMBRIA COUNTY.

By CHAS. B. DUDLEY, M. D., *Medical Inspector.*

DR. BENJAMIN LEE, *Secretary State Board of Health.*

DEAR SIR: I went to Gallitzin on Saturday last, and found that there have been within the last six months, a very large number of deaths, notably of children, from diphtheria. I have taken measures to get a record, as near as it is possible to be obtained, of the exact number. During the fall and early winter, diphtheria was almost epidemic. It then seemed to disappear, and it was hoped that there would be no further difficulty, but within the last few weeks, it has apparently broken out again.

The cause of the disease is apparently very easy to locate, and may be summed up fairly in one word, namely, filth. There is no public water supply in the borough, the water being obtained from two or three springs, and wells. The wells are frequently not twenty feet away from the privies. There is no sewer system, and indeed not a single foot of sewer is laid in the borough. The house slops are usually thrown on the ground back of the house, and of course the water in the wells of those lower in the town, gets the drainage not only of the privies, but also of the cess-pools and house slops of those living on higher ground. There is also a very great lack of the ordinary precautions in regard to the spread of diphtheria, especially in isolating the cases from the other children in the house, and also in the matter of public funerals. The people are not easily led, regard sickness as an affliction of Providence, to be borne simply, and antagonize any efforts at cleanliness or other precautionary measures. The population is largely engaged in coal mining, and there is quite a dearth of enlightened public opinion. The office of burgess goes a begging, because there are no emoluments connected with it, and is at present badly filled, and taken as a whole, the condition of the borough is simply lamentable.

Efforts are being made to start a water company, and we believe one has been organized, but no definite measures have yet been taken to secure a supply, if indeed a good public supply is possible in a town situated so near the top of the mountain. At present it does not seem that the condition of the place can be regarded as a nuisance dangerous to the public health outside the town. At the same time it must be confessed that it seems probable, that diphtheria will be epidemic more or less in that locality until some energetic measures are taken.

I have sent copies of the "Compendium of the Laws relating to public health and safety;" "Constitution By-laws and Regulations of the State Board of Health," and "model ordinance for the better pre-

servation of health in cities and boroughs," to a member of the borough council, who is public spirited and energetic.

The only remedy for the state of affairs at Gallitzin is a dissemination of information, and by the building up of public sentiment and encouragement of public cleanliness, obtaining a better sanitary condition of the place.

VII.—INSPECTION AT WALLINGFORD, DELAWARE COUNTY.

By WM. B. ATKINSON, M. D., *Medical Inspector.*,

In pursuance of your instructions I visited and inspected on May 18th the R. R. station at Wallingford. The agent Mr. Wetzell had just lost his child about five years of age with scarlet fever. I found a very damp cellar with a cistern in its centre for the purpose of supplying the water to be used by the inmates. Into this I was informed that there appeared at times to be drainage from the vicinity. The water was both from springs and from the usual surface or drain water. The cess pool about thirty feet away was rather full and that part used by the public was very filthy. The drainage was by means of a terra cotta pipe into a creek some twenty or thirty feet off. The station is in a sort of basin in the lowest part of the vicinity and is liable to be more or less affected after rain falls, there being a decided fecal odor in the place on such occasions. There is no ventilation of the water cistern, and when opened the surface was covered with green scum, and a fine mould was seen around the wood and stone work. I would feel doubtful as to the use of this water. Under the direction of a physician, the house had been fumigated with sulphur, although the family of the agent had not deemed it safe to return. The only way to prevent other disease I think would be the changing of the station to better ground; the examination of the drain pipes, to be positive that they are doing the work for which they have been laid, and also to make sure that there is no leakage from them into the drinking water. I advised the agent who himself presented a very sickly appearance, to be careful as to bringing back his family to the station.

VIII.—INSPECTION AT KINGSLEY, SUSQUEHANNA COUNTY.

By LEWIS H. TAYLOR, M. D., *Medical Inspector.*

In accordance with instructions received from you June 15, I yesterday visited Kingsley, Susquehanna county, Pa., to investigate the sanitary condition of premises occupied by Messrs. Robinson and Woolwich proprietors of creamery.

The decaying milk, whey, refuse, etc., from this creamery causes a nuisance unqualifiedly. The building used for the manufacture of cheese stands very near the Delaware, Lackawana and Western Railroad tracks, and but a few yards from the depot. There are about fifteen families affected by the stench arising from the decaying material, which is entirely upon the surface of the ground. C. M. Squire the manager in charge, informs me that between six and seven thousand pounds of milk are used daily. The whey from this runs off through an open trough and falls some feet to the ground.

It then passes off through an open ditch or gutter into a meadow, where a portion of it finally finds its way into Martin's creek. The location is somewhat as roughly sketched below.

The proper disposal of this material would be to carry it by means of a vitrefied terra cotta pipe, laid three feet under the surface of the ground, into Martin's creek, say at a point marked "9", but the owner of field "5" demands damages if the ditch should be dug through his meadow, and suggested to me that he ought to have a hundred dollars. This is unreasonable as the field is of no value and the digging a ditch for the purpose of laying this sewer pipe would do scarcely any damage at all. I would recommend then, that this pipe be laid down the public road and enter the stream at the point marked "10." I am told that there are a number of dams on this stream and that it is frequently flushed through the summer, almost daily. I do not think the discharge of this whey once a day into a running stream would be objectionable. It is its accumulation and decay in the hot sun that causes the trouble. It is possible that this material passing down the stream in front of Mr. Tiffany's residence, might be objectionable to him, but if the stream is even one-third as large at low water as at present, (and the residents say it is,) there would not be a sufficient quantity of the refuse remain along the banks to be prejudicial to health. If however this should occur, a pipe could then be laid in the bottom of the creek from point "10" to "9".

The owners of the creamery Messrs Robinson and Woolwich, live in New York, 166 Broadway. The agent in charge is C. N. Squire, Kingsley, Pa. In view of the fact that the owners do not live in this state, I would suggest that you write them a letter urging the immediate laying a closed pipe as suggested above to carry this material into the creek, and that the offensive material now on the surface of the ground be removed, buried, and the place disinfected with lime, chloride of lime or copperas.

From what I can learn of the character of the proprietors, I think such a recommendation from you would bring about the desired result. If the work be not commenced at once, we can then formally notify the agent and compel him to abate the nuisance.

IX.—INSPECTION AT CANNONSBURG, WASHINGTON COUNTY.

By J. R. THOMPSON, M. D., *Medical Inspector.*

I visited the town immediately on receipt of instructions, and vaccinated persons in the hotel. Those guests absent at time of my visit, Dr. Donaldson promised to attend to. In fact the doctors of the town sent immediately to Pittsburgh for quills, when the report came to them from Pittsburgh that the sick man, so recently in their midst, was suffering from small-pox. Ordered the bed-clothes to be boiled, bed-tick and contents burned and the room fumigated with sulphur according to circular No. 8 "Precautions against small-pox." Left circular 8 with the Burgess of the town, also at hotel and with Dr. John B. Donaldson who attended the sick man, and sent him to Pittsburgh, where he found his way into Mercy hospital, and from there to the Pittsburgh pest-house, at which place he died Thursday July 18, 1889, of what is termed variola hemorrhagica. He had not been vaccinated. Through inquiry from his boss, D. D. Nolan, allowing twelve days for incubation, I find the disease was contracted at Bradford Pa. or thereabout.

X.—INSPECTION AT MIDDLETOWN, DAUPHIN COUNTY.

By PAUL A. HARTMAN, M. D., *Medical Inspector.*

On July 17th, I inspected the Slaughter houses of Middletown, Pa. There are nine such places in the town, owned by the following named persons. Hawley, Houtz Bros., Ancherman, Sheitz, Creamer, Detweiler, Wagner, Erisman, and Crull.

All these places are bad, because of the method used in disposing of the blood and waste of the slaughtered animals. The habit is to throw the blood and waste parts into the manure pits, and spreading a slight cover of manure over the mass which is exposed to the weather.

This horrid mass of putrefaction is added to weekly for months, and carted away during the cold weather in early spring.

The worst of these places, by reason of location in the centre of the town, is owned by Mr. Crull. He has *now* commenced to clean up his place and it is hoped there will be no cause for future complaint.

Mr. Crull lost a daughter by typhoid fever a few days ago, and at the rear of his property there is now a case of this same disease. It is believed that both cases of fever originated from the filth in this establishment.

There are no sewers in Middletown—nothing but surface drainage, so that all kinds of filth are exposed and of necessity must cause trouble.

Orders have been given to the owners of these places to clean up their

premises and to keep them so; to remove all waste outside the town and to bury it. The proper way to keep down this nuisance is to remove the establishments from the town, and to erect a general slaughter house for the use of all engaged in the business. I would so recommend.

XI.—INSPECTION AT DRY RUN, LOWER PATH VALLEY, FRANKLIN COUNTY.

By R. L. SIBBET, M. D., *Medical Inspector.*

(*a.*) REPORT.

In compliance with your instructions which reached me on the 22d. instant, I set out for Dry Run, a village of two hundred inhabitants in Lower Path valley, Franklin county. The distance from Shippensburg to it by the way of Roxberry over two mountains, is twenty-two miles. The valley in which it is situated is about three miles long and two broad. In the southern end which is known as Lower Path valley, the water flows toward the Potomac: in the northern end which is known as Upper Path valley, the water flows into the Juniata. Although this valley is beautiful and rich, and is somewhat isolated in the mountains of Pennsylvania it may easily become the theatre of contagious and communicable diseases.

The village of Dry Run is situated in the forks of a stream which is dry part of the year and hence the name. It is from four to eight feet above the bed of either branch of the stream, and therefore could be easily drained. No effort however has been made to do this by the supervisor of the township or by the people; and hence it is in a very filthy condition, and is becoming more so every year. Before leaving the village a sketch of it was placed in my hands which will give you a more distinct view of the situation. It is chiefly built on the right and left of a main street and a cross street, and the stables are unusually close to the dwelling houses.

The water lies near the surface of the ground and it is abundant. Three springs issue from the limestone rocks at the foot of the village; and besides there are at least ten wells of water in it. To escape the surface water during the spring months and after freshets two deep wells have recently been bored, and the water is drawn from the bottom of them through iron pipes. Excellent drinking water has thus been obtained. The other wells are not more than sixteen feet deep, and the water is drawn from them by chain pumps. In the spring of the year and during heavy rains the water rises in several of them to within a foot or two of the surface.

The well on the premises of George W. C. is in the lower part of the village, and the trend of the adjacent surface is in the direction of it.

Heavy rains fell on the 30th and 31st of May last, and filled this well with surface water.

The drain from a dozen or more stables, pig-pens and privies being in this direction polluted this well, as is now generally believed.

Dr. B. F. Shope, reports the following cases of typhoid fever resulting from the use of the water of this well.

Mr. G. W. C. the owner of the well, twenty-six years old, residing near by, drank of the water, sent for Dr. S. June 18, had the prominent symptoms of typhoid fever—nose bleeding, delirium, diarrhoea and hemorrhage from the bowels, was in bed four weeks, is convalescing.

Mr. J. R. aged forty years, brother-in-law of G. W. C. drank of the water while on a visit, lives in the country, took sick with typhoid symptoms June 23, was in bed four weeks, is convalescing. Miss C. aged sixteen years hired girl of J. R, drank of the water, took sick in the country with typhoid symptoms, June 23, was in bed four weeks, is convalescing.

Mr. D. C., aged 22 years, brother of G. W. C., drank of the water while on a visit, took sick in the country June 23d, had high temperature, delirium, diarrhœa, is convalescing.

Mr. W. C., aged 20 years, brother of G. W. C., drank of the water while on a visit, took sick in the country June 23d, had high temperature, delirium and diarrhœa, is convalescing.

Miss J. C., aged 18 years, sister of G. W. C., drank of the water, took sick in the country June 23d, was unconscious from the first, had diarrhœa and hemorrhage from the bowels, all the symptoms malignant, died.

Miss S. C., aged 23 years, sister of G. W. C., drank of the water, took sick in the country June 25th, had waited on her brother, had also malignant symptoms, hemorrhage from the bowels, jactitation and coma, died.

Mr. J. C., aged 62 years, father of G. W. C., drank of the water while visiting his son, took sick in the country June 25th, symptoms malignant, diarrhœa, hemorrhage from the bowels, coma, died.

The following persons not closely connected with this family also drank of the water.

Mr. Z. P., aged 21 years, harness maker, took sick June 23d, had high temperature, diarrhœa, delirium, characteristic rash and hemorrhage from the bowels, is convalescing.

Frank H., 18 years of age, took sick June 23d, had prominent symptoms of typhoid fever, is convalescing slowly.

Mr. B. B., clerk in store, took sick June 26th, had the prominent symptoms of typhoid fever, is in bed yet.

In the mean time Dr. S. took sick and Dr. T. H. Walker took charge of his patients, and they report in addition six other cases with the

undoubted syptoms of typhoid fever, who had not drank of the water of this well, making in all fifteen cases in their practice.

Besides these, they have had fifteen other cases of a milder type which they have treated as continued fever; all are convalescing except several new cases.

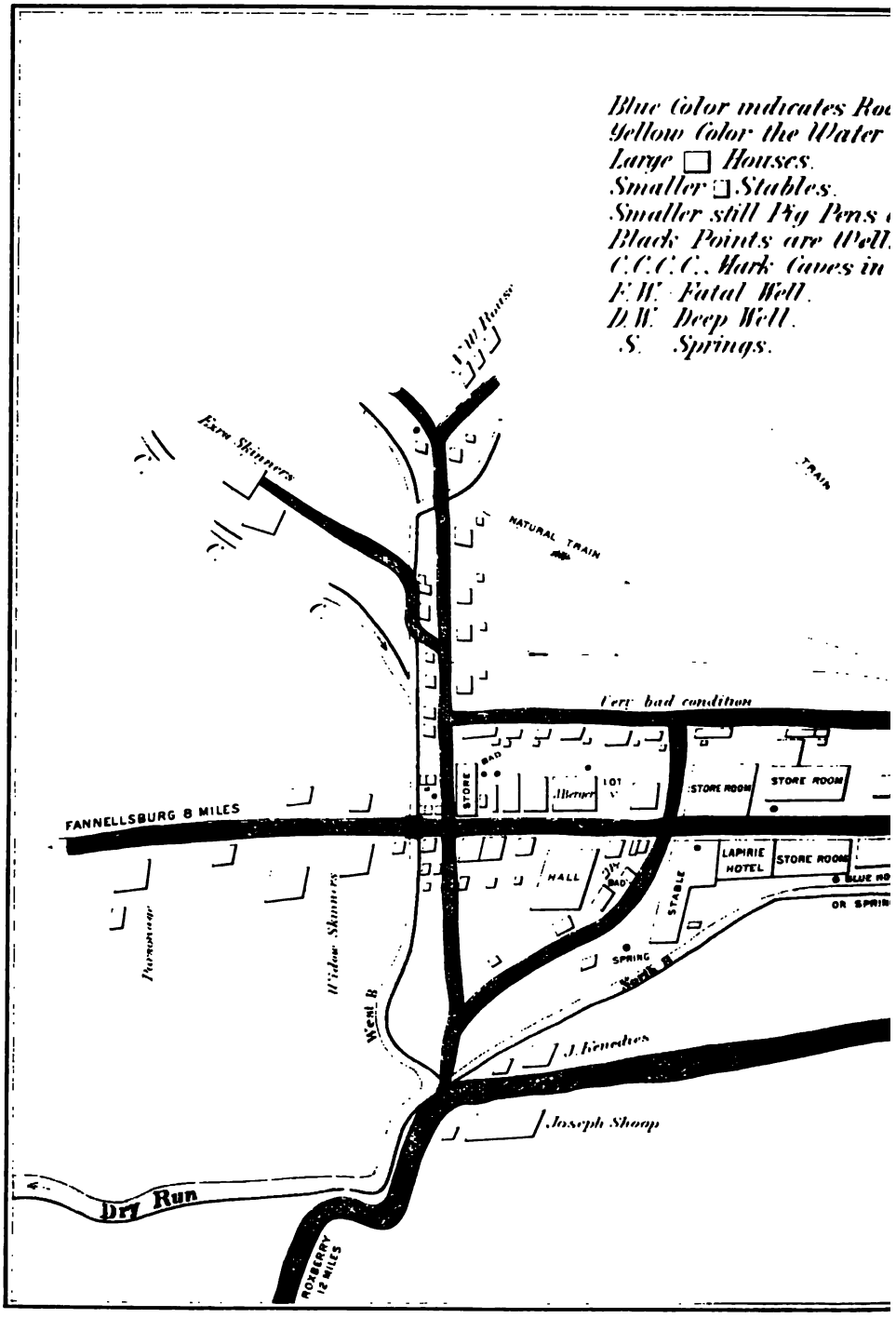
These practitioners have also had a few cases of remitting fever, and several with the symptoms of intermitting fever or ague.

Dr. E. G. Jones reports sixteen cases, most of them distant from the village which he has treated as continued, remitting and intermitting fever. His first six cases took sick between June 19th and June 27th. Three of these were in one family, which would show a common cause. Two were in bed three weeks: the others for a shorter time; all are convalescing, except three recent cases.

From the foregoing it is apparent that the cause of the epidemic in Dry Run and in Path valley, is to be found in the pollution of the drinking water. The recent heavy rains produced an unusual amount of surface water which entered the wells and springs. There is possibly nowhere on record a clearer case of surface contamination with more direct results, than that of Dry Run. Prior to the 18th of June, there was no fever in the village or in the valley, which gave a period of eighteen days for incubation, reckoning from the time of the very unusual rain storm by which Johnstown was swept away, and a large portion of Pennsylvania drenched. The case is one in which it is very evident that the greater the degree of contamination, the more malig nant the type of fever. (Counting from the 24th of June, when the attending physician forbade the use of the water of the well owned by Mr. G. W. C., no more malignant cases were produced.) Those which followed were produced by water with less pollution in it. When there was not sufficient contamination to produce malignant typhoid, it produced continued, remitting or intermitting fever.

We cannot suppose that this epidemic originated in exhalations from the earth, or that it has been continued by the inhalation of foul odors, or by contact with the sick. The rain storm, the overflow of wells and springs, and the sudden appearance of twenty-five cases within one week preclude these suppositions.

Immediately after my visit and inspection, I addressed several pages of instructions and orders to the property owners of Dry Run and vicinity, copies of which I herewith send you. In brief, I directed that their cellars should be drained and disinfected with lime: that their stables, pig-pens, poultry-yards and privies should be cleaned out and disinfected: that the well owned by Mr. G. W. C, should be closed; that the people should place themselves under borough law, and should give attention to the subject of drainage, and to a supply of wholesome drinking water.


Blue Color indicates Roc
Yellow Color the Water
Large ☐ Houses.
Smaller ☐ Stables.
Smaller still Pig Pens
Black Points are Well
C.C.C.C. Mark Caves in
F.W. Fatal Well.
D.W. Deep Well.
S. Springs.
J.W. Bates
Extra Skinners
NATURAL TRAIN
TRAIN
Very bad condition
STORE
BAD
Mercer
LOT
STORE ROOM
STORE ROOM
FANNELLSBURG 8 MILES
HALL
LAPIRIE HOTEL
STORE ROOM
STABLE
SPRING
Parsonage
Widow Skinners
Weal B
J. Knowles
Joseph Shoop
Dry Run
ROXBERRY 12 MILES

TRAIN
TRAIN
D.D.Skinners
TO CONCORD 6 MILES
Mrs Hallidays
D.D Skinners
Big Ste
James B. Hallidays
CHURCH
SPRING
TO DOYLESBURG 4 MILES

(*b.*) RECOMMENDATIONS TO PROPERTY OWNERS.

To the Property Owners of Dry Run and Vicinity, Franklin County, Pennsylvania.

The undersigned acting under authority of the State Board of Health respectfully requests your attention to a few preliminary remarks which may serve to explain the orders herewith appended.

There are two subjects which claim the attention of the inhabitants of every village, town or city, especially the property owners. These are (1) drainage and (2) water supply.

Organization is of course necessary; in other words, you must obtain a charter, and place yourselves under borough law. The health of the people requires this; but there are other reasons. The value of your property will be enhanced, and your business will be improved.

In your case, surface drainage, I believe, is all that is needed, but this must be efficient. The drains must be properly constructed, but need not be expensive. They must be large enough to carry away all surface water.

For a supply of drinking water you must not depend upon the wells which you now have. You have at least ten wells in your village, but only two of these can be considered as containing wholesome and palatable water. One of these is forty feet deep, and the water is drawn from the bottom of it through an iron pipe which of course excludes all surface water; and the other is eighty feet deep, the water of which is also drawn from the bottom through an iron pipe. The water of both is no doubt as wholesome as it is cool and palatable. The other wells have only a depth of twelve, fourteen or sixteen feet and are walled in the usual way with stone. Now it must be evident to you all, that if your cellars became full of water during a freshet or heavy rain, that your wells will also become full of the same kind of surface water. It must also be evident that your stables, privies, pig-pens and chicken yards, being but a few feet distant must pollute your cellars and wells with a part of their contents, by percolation through the soil. Nor can you doubt that the three springs at the foot of your village are liable to the same kind of pollution.

There remain then but two sources from which you may obtain a sufficient quantity of wholesome drinking water. In addition to the two deep wells referred to, four or five others might be sunk for the benefit of the public. These might supply sufficient water for your village which contains about two hundred inhabitants. But it is probable that a sufficient quantity of pure water might be brought in pipes into the village from some point not exceeding two or three miles, and in some respects this might be preferable.

The heavy rains of May 30 and 31 thoroughly saturated the surface soil of your village, and at least one lot of ground was covered with

water several hours. The pollution referred to was thus carried into your cellars and wells, in larger or smaller quantities and gave rise to a most malignant form of typhoid fever. One of your wells is situated in a part of your village two or three feet lower than other parts and to this point the water inclines. The proprietor was one of the first to complain to his physician (June 7). His immediate relations came to visit him from the country, five of whom also took sick and three, father and two sisters, died after returning to their home outside the village. All had drank of the water of this well. In the meantime five others residing near by took sick with the same serious symptoms, but are fortunately convalescing. They also drank of the water of this well until the attending physician forbade its use. The water is drawn from it by a chain pump.

Lest any one should doubt as to the character of the disease resulting from the use of this water we may mention some of the symptoms of the worst cases; high temperature, rapid pulse, delirium, diarrhoea, hemorrhage from the bowels, jactitation and coma.

As to the water in the other wells which rises within five feet of the surface of the ground in the spring of the year and during freshets, I have no hesitation in saying that it contains impurities—animal and vegetable matter—in larger or smaller quantities and that the analysis would condemn it as a beverage. It is, at least in part, surface water, and is more or less polluted.

What is true of the wells of your village is also true of wells adjacent to farm buildings in other parts of Path valley, and the water which they contain is often the unsuspected cause of typhoid and other fevers. The greater part of it is surface water which is necessarily more or less polluted, after sudden and heavy showers of rain.

About fifty cases of typhoid and other fevers have already appeared in your village and vicinity and it is probable that they may assume the form of an epidemic if indeed they have not at this date. We have no reason thus far to believe that these forms of fever—typhoid, continued, bilious remitting, and intermitting—have originated by exhalations from the ground and therefore the more easily arrested.

Contaminated drinking water is the most frequent source of typhoid fever, which you undoubtedly have, in your village and neighborhood. Circulars Nos. 18, 19, 20 and 21 issued by the State Board of Health which I have left with you for distribution will supply any lack of information on the subject of contagious or communicable diseases. Until further orders are issued you will be governed by the following.

(1). That each and all of the owners of property in Dry Run and vicinity into whose cellars water has recently entered shall cause the same to be removed and shall white-wash the walls and disinfect the floors, using not less than half a bushel of lime in each case.

(2). That those of you having stables, pig-pens and poultry yards

epidemic, yet it would be impractical to ask for a change in this matter. All the wells must be greatly contaminated and it is marvellous that shall immediately remove all animal excrement from them and shall disinfect them by the free use of lime.

(3). That those of you who have the control of privies or water closets shall immediately disinfect them, with the use of at least half a bushel of lime in each case; and when cold weather comes in the month of November you shall cause the same to be cleaned out and disinfected.

(4). That those of you having wells of water within fifty feet of any stable or privy shall cease to use the water of the same for drinking, or culinary purposes; And the well on the lot of ground owned by George W. Coons is hereby ordered to be closed to the public and the proprietor is forbidden to use the water of the same for drinking or culinary purposes.

Any property owner neglecting or refusing to comply with the above orders will be liable to prosecution by the executive officer of the State Board of Health.

R. LOWRY SIBBET, M. D.
Medical Inspector.

CARLISLE, PA.
July 27th, 1889.

XII.--INSPECTION AT PHILLIPSBURG, CENTRE COUNTY.

By GEORGE G. GROFF, M. D., *Member of the Board.*

At your request, I visited Phillipsburg, Centre county, Pa. I found Phillipsburg situated near the summit of the Allegheny mountains, on a stream called the Shannon river. The situation of this town is very favorable for good health, as the air is very pure, and the town plot is so formed as to give *almost perfect* surface drainage. There is a meadow along the Shannon, but almost all the houses are built on the elevated ground above the river. The town suffered almost nothing from the flood of the summer, and on the contrary, the almost constant testimony was that the floods were a benefit to the place, as they cleansed all the gutters thoroughly. So far as I could see, the testimony of the people was correct, that the town was cleaner than ever before. I called upon Dr. Dorman and two druggists, who seemed to be representative citizens.

The population of Phillipsburg is about three thousand. Drainage on the surface. The water supply is from a mountain stream, called "Cold stream," and is an excellent water. The only health matters that I observed that needed attention, were matters which could be easily remedied by the people themselves.

1. All the filth and rubbish of the place seems to be thrown into the Shannon; the amount of this filth is so large, that the small stream has been actually clogged by it.

2. At the *upper end* of the town, *on the Shannon*, is a slaughter-house, and all the refuse from the same seems to be thrown into the stream.

3. By means of logs and branches of trees, the waters of the Shannon are made stagnant; these ought to be removed, when the stream would become one of pure mountain water.

The cholera infantum, which prevailed at the time of my visit, I attributed to the hot days and *cold nights*, together with improper home attention of the infants. I saw no general condition in the town to produce it.

I recommend that the town council be advised to keep the Shannon open, and that a supply of the circulars on the "Care of Infants," be sent to the place.

XIII.—INSPECTION AT KILKENNY, MONTGOMERY COUNTY.

By WILLIAM B. ATKINSON, M. D., *Medical Inspector.*

In response to your instructions I visited this day the village of Kilkenny, located between Haverford and Bryn Mawr on the Lancaster Improvement Company's road. It consists of about forty houses and has about two hundred inhabitants. I found an entire absence of drainage except over the surface, and but little effort to direct the drainage into the gutters on the sides of the pike. Every house uses as drinking water that obtained from the ordinary wells, into each of which at every rain the surface drainage is sure to flow. The worst places were those of Mr. Thos. Lyons who has at the back of his lot a stable and a manure heap, the flow from which passes on to the ground of a Mr. Timothy, forming quite a pool, runs along to the end of this lot and is then carried down by an open ditch between this and the next lot to the east, and then into the gutter of the pike. The cellars of two houses are more or less full of this drainage. In one the filthy water was about one foot in depth and very offensive. These houses are tenements owned by a Mrs. Magee who occupies the house in front on the pike, and which is in good condition as to its cellar, etc. I examined a number of the premises and found them generally in good condition. There was but little sickness in the village, mainly of children and none referable to bad hygienics.

I found also a heap of manure on the premises of a Mr. French, back of the Magee houses, and the drainage of which must undoubtedly contribute to fill the cellars in front as mentioned above.

Also a very filthy hen yard and pig pen of a Mr. Loughrey, Kilkenny.

While the drainage and general hygienic condition of the entire place is about as bad as they can be without the prevalence of a general

an epidemic of bowel trouble does not prevail. I can only attribute its absence to that condition of the system so often seen where people become acclimated, so to speak, and are not made sick where others coming to live there and drink the water would be sure of an attack.

As a partial solution of the problem, I would suggest that Mr. French be directed to remove the pile of manure on his lot, and keep the ground in a proper sanitary condition.

That Mr. T. Lyons be directed to remove the manure from his place, and also that he be required to place a drain pipe so that it will carry off the drainage, which at present overflows the neighboring properties.

That Mr. Loughrey be directed to clean up the hen yard and pig pen on his premises.

Under the circumstances I shall not be surprised at any time to learn of an epidemic of any kind in this locality.

XIV.—INPSECTION OF THE CANAL BED IN INDIANA AND WESTMORELAND COUNTIES.

By H. F. TOMB, M. D.

(a) COMPLAINT.

The undersigned citizens of Westmoreland and Indiana counties, would respectfully call your attention to the condition of the "Old Pennsylvania Canal," now owned by the Pennsylvania Railroad Company, from Centreville to Lockport, a distance of about five miles. That is now filled up with brush and water which has become stagnant, and a general miasmatic condition is the result, causing ague to many of the residents near the canal, and if the present condition remains throughout the approaching warm weather, disease must necessarily follow. In the interest of humanity, your petitioners respectfully ask your Board to take immediate action upon the same, as great suffering and loss of life may result if action is not taken promptly.

W. M. LIGGETT,
WILLIAM GOFFE,
REUBEN RAGER,
T. W. CAMPBELL,
R. W. HAMILTON,
JOSEPH ST. CLAIR,
HUGH RAGER,
J. M. LIGGETT,
CHARLES GOFFE,
WM. J. MCNEILLY,
W. R. STEELE,
I. S. MATTHEWS,
W. J. CLARKE, M. D.
J. H. LAFFERTY, M. D,
JOHN FULCOMER,
S. FULCOMER,
GEO. FULCOMER,
WM. ALEXANDER,
M. F. SHOMO,
JOHN C. CABES,
DAVID HARRIS,
SAMUEL VANATTA,
FRANK GRAHAM,
HENRY FULCOMER,
DAVID B. LUTE.

(*b*) REPORT.

In pursuance of the request sent you, and according to your instructions, I visited New Florence and made an inspection of the old canal bed from a point just opposite New Florence, called Centerville, to within one half mile of Lockport. The canal here is on the Indiana county side of the river. I wish it understood that the present condition of the canal is no worse than it has been for years, and our recent flood has had nothing to do with bringing about the condition at present. The canal at some points was flooded, but very little debris was left. I found the canal bed covered to the depth of from six inches to two feet with mud and stagnant water. The water in many places covered with greenish scum and even at the present time emitting an odor, notwithstanding our recent wet weather. I am told by those living along the canal that in dry, hot weather the odor is much worse.

The canal bed has been allowed to grow up with weeds, bullrushes, water lilies and willows until the rays of the sun are shut out, and no chance given to dry the place. I consider it, not in good sanitary condition.

Dr. Lafferty attributed a number of malarial cases of recent years to the condition of the canal. As many as twenty cases of malarial fever have occurred along the canal in one year, and as malarial diseases are not common in this section of the country, it is but fair to attach some weight to the evidence. I would suggest that as a means to remedy the trouble that the brush and weeds be cleared away and the sunlight allowed to get in, and further that a ditch of sufficient depth and width, be dug along the centre of the canal bed giving a chance for the water to drain away. It could be drained into the several ravines that extend up to the canal, I think there would be sufficient fall.

XV.—INSPECTION OF THE WATER SUPPLY OF WILKES-BARRE, LUZERNE COUNTY.

By LEWIS H. TAYLOR, M. D., *Medical Inspector.*

(*a*) REPORT.

In response to your letter of July 22, 1889, directing me to inspect the condition of Laurel Run or other waters supplying the city of Wilkes-Barre with drinking water, and to your previous letter requesting a report on the typhoid fever existing in this city; I would say first of all that my report has been necessarily delayed by the difficulty in securing statistics of the disease and by the necessity of

making several visits to the mountain streams which supply the city with water.

In my letter of July 15, I said "we have a number of cases of typhoid fever in Wilkes-Barre at present, and the water supply is naturally suspected. Although some of our people are alarmed there is nothing approaching a general epidemic."

The trouble increased daily, and by July 19, I wrote in response to your inquiries, "there is at present an unusual number of cases of typhoid fever for this season of the year in Wilkes-Barre. Since the middle of June there have been probably from seventy-five to one hundred cases. The newspapers at the suggestion of physicians have urged the people to boil the drinking water, but it is difficult to impress the necessity of this upon certain classes." Even then I did not consider the situation so serious as it has since proven to be.

The first cases to appear were noticed about the twentieth of June and others appeared quite rapidly during the remainder of June and on through July. In order to ascertain the exact condition of affairs I personally visited all of the physicians of Wilkes-Barre but three, and with these I communicated by telephone and letter. Each gave me willingly his statement of cases as well as his opinion upon the nature of the disease under treatment. While there were some who had seen no cases of typhoid, but had treated malarial, intermittent and remittent fevers and were inclined to think the present epidemic more of that nature, the majority of physicans reported cases of genuine typhoid, as well as some of the other forms. I finished this investigation by the twenty-seventh of July, but being delayed by rainstorms in completing my examinations of the streams, until after August 1, I thought it best to report the number of cases to that date, so a circular letter was sent to each physician requesting a statement of cases to August 1, and also a statement of cases of fever not distinctly typhoid. I received replies from nearly all of our physicians and from these replies I find that Wilkes-Barre has had between June 20, and August 1, two hundred and twenty-nine cases of typhoid fever, and one hundred and sixty-six cases of malarial or of doubtful typhoid; surely too large a number for our usually healthy city.*

The question naturally asked, and which has been frequently asked during the past month is, to what shall we attribute this unusual amount of sickness in our midst?

The opinion has been advanced by a few that owing to excavations in many of our streets for purposes of paving, sewering, etc., the emanations arising therefrom have been a fruitful source of disease.

*Since writing the above I have received reports from other physicians which swell the number to over 250. No doubt many of the doubtful cases mentioned in one hundred and sixty-six cases will prove to be typhoid. If we add to this the numbers that have appeared since August 1, we would have without doubt between three and four hundred cases.

We do not even have to go back to the memory of our fathers to recall that in recent years, River, Franklin and Washington, and other streets, were excavated almost their entire length for sewering purposes and we did not have an epidemic of typhoid fever from this cause. Again the same streets were excavated for purpose of paving, the excavated material used, as it is this year, for filling up other streets and some of it was spread out upon the river common, and yet we did not hear of an epidemic of fever arising therefrom.

That typhoid fever may be communicated through the atmosphere is still a disputed question, but all medical men will, I think, admit that if it be thus communicated the proportion of such cases to the whole number, is exceedingly small. All however will admit that the majority of cases arise from taking polluted material into the stomach in the form of food or drink.

This being the fact, the first inquiry that naturally presents itself is, what is your water supply? and what do you know of its condition? This question was asked in Wilkes-Barre and asked with some alarm, as many remembered that only two winters ago it was necessary for the State Board of Health to insist upon stringent precautions on the part of contractors and men building the new branch of the Lehigh Valley Railroad, and the thought arose that possibly, even at this late date, some of the excreta of the hundreds of men there employed had been washed into our reservoirs by the heavy rains in the latter part of May and early June. That this could not be the case will be shown further on.

The city of Wilkes-Barre, as I informed you in my report of January 1888, is supplied with water by two companies—the Wilkes Barre Water Company, and the Crystal Spring Water Company, each taking its supply in the main from streams which arise in the neighboring mountains—the former company supplies in general the older part of the town with a few streets on Brewing Hill, also the neighboring villages of Miners Mills and Parsons; while the latter supplies chiefly Brewing Hill, Moseytown, Rolling Mill Hill and Ashley and the lower lands in the southern part of our city.

Taking the accepted theory, which has been proven so often as to have no room for doubt, that typhoid fever arisies mainly from polluted water, we suspect the cause of the present epidemic to be in the supply of one or of both of these water companies. If we found the cases of fever equally distributed over the city, we might suspect a general cause, if however, we should find them mainly or entirely in the region of one company and not of the other, we should rightfully suspect a local cause.

These 229* cases are located as follows:—on River street, 11; Dana

*Of the above mentioned cases at least eighteen have died up to August 11.

Place, 1; West river, 4; Franklin street, 9; Main street, 13; Washington street, 14; Canal street, 23; Market street, 5; Northampton street, 3; South street, 9; Academy street, 7; Sullivan street, 2; Wood street, 9; Hanover street, 3; Oregon street, 1; Railroad street, 1; Carey avenue, 2; Susquehanna street, 2; Richards street, 1; Hazle street, 1; Helfricks court, 1; Dana street and South Main, 2; Ash street, 3; Wrights alley, 1; New Wrights street, 1; Gildersleeve alley, 1; South Fell street, 7; Jackson street, 4; Centre street, 1; Bennet street, 1; Madison street, 5; Scott street, 13; Bowman street, 2; Kidder street, 8, Kulp avenue, 1; Hollenbach avenue, 1; Maple street, 1; Linden street, 2; Elm street, 1; Pearl street, 2; Walnut street, 1; Darling street, 1; Court street, 1; Henry street, 1; Baltimore street, 1; Welles street, 4; Lincoln street, 11; Park avenue, 2; Grant street, 5; South Hancock street, 2; Hancock alley, 1; Coal street, 1; Regent street, 1; Parrish street, 3; High street, 2; Sherman street, 1; Hill street, 4; Harrison street, 1; North Blackman street, 1; Lehigh street, 2; South Meade street, 2; North Hancock street, 1; Dana street, 2; —229.

In the above list all of the streets mentioned as far as Welles street, are in the Wilkes-Barre Water Company's territory. From Welles on they are in the Crystal Spring Company's territory. Welles street is supplied with pipes from both water companies. Three of the four patients are on the south westerly side of the street, and are supplied with Laurel Run water. Lincoln and Grant street also have the pipes of both companies. Of the eleven cases on the former, five are between Northampton and Market, where the street is supplied with Laurel Run water: of the 5 cases on the latter, three are near Coal street, where the Laurel Run pipes are used. This gives us 195 cases among persons supplied exclusively with Laurel Run water, leaving thirty-four located in the territory supplied with Crystal Spring water. Among these, those persons who work in town have used water from the Laurel Run pipes and consequently were exposed to whatever danger existed in them, and should properly be classed as drinkers of Laurel Run water. In addition to the three mentioned as living on the southerly side of Welles street, there is one other on the opposite side, but he works in town in a foundry.

Of the remaining six cases on Lincoln street, one is a young man who works in town in a packing house, another works at the stone quarries, two others reported that they had used Laurel Run water as well as Crystal Spring, while the others were simply reported as Lincoln street, and the location not stated.* The one on North Hancock used Laurel Run water. Of the two on South Hancock, one is a butcher who drives all over town, the other works in a livery stable in

* I have since learned that these two are on Lincoln, between Northampton and Market.

town. The one on Coal street is fireman at Electric Light works. The one on Regent street, who died with the disease, contracted it on Madison street, where she was staying previous to her illness.

The three reported on Parrish street, were all reported as working in town. Of the two on High street, one is reported to have drank water frequently on Hanover street; the other is simply reported High street.

The one on Sherman street, was a clerk in a Market street dry goods store. Of the four on Hill street, one is a barber working on the Square, and the others are all reported as having used Laurel Run water. The one on Harrison street works in town, as does also the one on Spider alley. The one who lives near Blackman street, works in South Wilkes-Barre. Of the two on Lehigh street, the one is a plumber who had been working in North Wilkes-Barre, and states that he drank freely of hydrant water; the other used water in South Wilkes-Barre where he frequently visited. The two on South Meade street, both used Laurel Run water, as did also the one on Dana street.

It will thus be seen that of the 229 cases, at least 226 of them have been known to use Laurel Run water, and of the remaining three the question has not yet been asked.* If the cause or causes of the disease be general, how does it happen that of a population of many thousands using Crystal Spring, only a few are affected and these among those only who have used water from Laurel Run. It might be mentioned also, that Ashley is supplied with Crystal Spring water and it is reported that no typhoid fever is there, while from Parsons, which is supplied by the Wilkes-Barre Water Company, Dr. Barton, at a recent meeting of the Luzerne County Medical Society, reported twenty cases. A simple perusal of the above facts, ought to convince the most skeptical that suspicion justly points to Laurel Run as the origin of the trouble.

On July 26, 1889, accompanied by Drs. Fell, Shoemaker, Stewart and George Loomis Esq., I left Wilkes-Barre at 12.15 and went to Laurel Run station on the Central Railroad of New Jersey. After thoroughly inspecting the outhouses at the village of Olivers Mills, we walked on the line of the new Lehigh Valley road to Kelly's creek, and thence down Laurel Run stream to the reservoirs of the Wilkes-Barre Water Company, and thence to Parsons village. At Olivers Mills we found a thriving village of twenty seven families, the most of them living within a few hundred feet of the stream, some of them being quite near. The powder mills have employed during the past year from one hundred to one hundred and fifty men, either in the mills themselves or upon improvements in and around the works. Whatever there is of surface drainage from these families, and from the works situated directly upon the stream must find its way into Laurel Run,

*See foot note on previous pages.

because it can go nowhere else. The majority of the families of this village are supplied with closets with inoveable boxes on sleds to admit of being hauled away at stated intervals.

These are situated above ground and, as we were informed by tenants and by the superintendent, are emptied once a year. This process is described by the proprietor of these mills, in the "Wilkes-Barre Record" of July 28, as follows:—The closets at these works, of which there are eighteen, consist of boxes on wooden sleds, so as to admit of being hauled out readily. Ashes or earth are then thrown upon them, and they are then hauled to some point a quarter or a half mile distant from any run or stream, generally a flat piece of ground, where a deep hole is dug. Each box is emptied there and mixed with earth, and the contents are then shoveled into the hole. When all the matter has been thus disposed of, lime is thrown over it, and over this a coating of earth one foot thick." The closets were emptied this year on May 30, and they were at the time of our visit in good condition. The location of some of them however, notably two at the school house and one at the saw mill, is dangerously near the stream. At the left hand side of the turnpike at the old boarding house, are two pits which are not in good condition. The old house having been abandoned, these are not in general use, but have recently been used by workmen.

Their contents could not get into the stream without leaching through the surrounding earth, but they are only a few yards away.

At the picnic grounds are two pits supplied with earth closets, and used only occasionally. Near the railroad are two other pits, tightly cemented. One of them in spite of all precautions leaks through its walls, and the oozing finds its way to the surface of the ground within a few yards of Laurel Run. There are two other pits on the opposite side of the road, which have not been emptied for a long time, but they are so far from the stream, that they are not dangerous. As stated above, the majority of the closets connected with the works were at the time of our visit in good condition. And I may say here that I believe the proprietor of these works is anxious to do everything in his power to maintain the purity of the stream, but I believe it is impossible to keep any stream perfectly safe for drinking purposes, that has so large a settlement upon its banks. The place of deposit of the excreta will be referred to further on. We found upon inspection of the line of railroad, where so many men were congregated in the winter of '87 and '88, that all of the shanties were abandoned except one. This is situated near the banks of Deep Hollow Run, a tributary of Laurel Run, and is occupied by a family and seven boarders. These are accommodated with an outhouse, with a deep pit located 225 feet from the stream. It is in good condition. We found the old pits used by the laborers abandoned, filled and covered with earth, and in such condition that it would seem impossible for any of the contents to be washed into the

stream. This is my reason for the statement on page 5, that the material from these pits could not have caused the typhoid fever in Wilkes-Barre. It should be said in fairness to both water companies, that after they had been warned of this danger in January 1888, they employed men to see that the instructions of the State Board of Health were carried out, and they kept constant watch of this part of their streams during the construction of the railroad. I believe a great calamity was prevented by the prompt action of the State Board on that occasion. Upon this trip of inspection I procured two samples of water, and sent them to Dr. Cresson as you directed. The first was taken from Laurel Run stream near the Powder Mills, just below fish pond, and was expressed from Laurel Run. The second specimen was taken from the centre of the lower reservoir and was expressed from Parsons. Now for the location of the excreta removed from closets at Olivers Mills. On August 2, 1889, accompanied by Dr. J. B. Crawford and B. M. Espy, Esq., Secretary of the Wilkes-Barre Water Company, I again visited Laurel Run stream at Olivers Mills. A part of the ground of my previous visit was gone over and the out-houses inspected. We then, accompanied by General Oliver, walked to the spot where the closets were emptied May 30, and the method of disposal was explained to us. This location is probably one of the most unfortunate that could have been chosen at an equal distance from the stream. Instead of being miles away from the stream as it should be, it is probably within five hundred feet of it in a direct line. Owing, however, to the intervening railroad and the fact that any material washing from this spot would have to flow along a gutter several hundred feet to reach a culvert, renders this location more safe than it at first sight would seem. It is true, it is upon a sloping bank fifty two paces from the edge of railroad cut. Any water reaching this edge would flow down its precipitous sides and thence along the gutter mentioned, travelling in all possibly a quarter of a mile before reaching the stream.

At our visit on August 2, the hole where the excreta were buried was fairly well covered up, but at its upper edge a number of barrel staves were sticking out of the surface. I stooped to pull one of these out, and exposed the contents of the pit some six inches below the surface. When we recall the fact that this material was placed here on May 30, and then recall the severe rainstorms of May 31, and June 1, we must consider it within the range of possibility for some of this material to wash into the stream.

Whether it did so wash or not must remain conjectural. I am inclined to think it did not, owing to reasons stated above. Even if it did there is no evidence that it contained typhoid fever germs. I could learn of no case of typhoid fever at Oliver's Mill within four years. This case occurred in the summer of 1885, and was in a young lady who had visited Sugar Notch where the fever was then prevalent, and

presumably drank contaminated water during her visit. The excreta from this case, I am informed by the physician in charge, were carefully disinfected and buried, so we have no reason to presume that they in any way affected the water this year.

In adidtion to the closets described at these works, there is a barn in which is kept a large number of horses. It is situated within a few yards of Laurel Run, but its drainage flows in the opposite direction, and would have to travel probably an eighth of a mile before reaching the stream.

There are also the numerous works for manufacturing, ponds with bathhouses for the men, etc. All of the surface drainage of this region, be it much or little, must enter the stream, as previously stated, because there is no other place for it to go. Turning from this to houses outside the jurisdiction of the powder mills, we find a state of affairs worse than any yet mentioned. On the opposite side of the railroad just across from the station, we find two double houses, occupied by four families, and supplied with two closets with pits; these on the days of our visits were full to overflowing.

The material was running out on the surface of the ground back into marshy ground from where a little stream conveyed it along the line of the railroad but a few hundred yards to Laurel Run stream. The condition of these closets is abominable. Further on down the railroad, *i. e.* toward Wilkes-Barre, we came to the red stone quaries, where are six families supplied with four closets. The first of these is directly in the bank overlooking the stream. It is supplied with a movable tub and its condition is not bad.

The second is situated some feet farther down the bank. It is built in the side hill with a dry wall and all liquid matter readily escapes and passes directly down the hill. The third is situated over a little gully which leads to the stream. This has walls of boards with no earth on the outside. The other two houses are situated some distance back from the stream and were not inspected. In addition to the three closets mentioned there are two barns. All are situated on the edge of a high bank which slopes precipitously down toward Laurel Run, only a few yards away.

Farther down the stream new quarries have been opened very near its banks, but I do not know how many men are at work at them, nor what closet accomodation they have.

Near Laurel Run station there is a divide or ridge in the watershed so that all water and drainage on the southerly side of this ridge would find its way in to Pine Run and thence into the reservoir of the Crystal Spring Water Company. In obedience to your instructions I investigated this supply also. In this inspection I was accompanied by Mr. Thomas H. Phillips, superintendent of the Crystal Spring Water Company, who had previously placed complete maps of their watershed

and a description of their system at my disposal. We left Laurel Run Station August 8, 1889, at 1.15, walked to Pine Run where it crosses the railroad, thence down the stream to the reservoir above Ashley, thence over to Solomon's creek, and thence rode up the planes to Mountain Top, stopping on the way to inspect closets used by workmen.

The closet at the station has a pit partly filled. Any matter that leads from this would have to pass several hundred yards through marshy ground before reaching the headwaters of the stream, so that it is safe. At the first dwelling reached beyond this we found a closet full to over-flowing and but a short distance from a little stream which trickles down under the rocks and eventually finds its way into Pine Run. We found near there also two boarding houses, containing in all twenty-five people *i. e* with the house first mentioned. These latter are supplied with a deep pit from which nothing at present washes into the stream. From this point on to the reservoir there is no house on the stream and no danger of pollution. Pine Run, a beautiful mountain stream is joined some distance above the reservoir by two other small streams whose names I could not learn, all furnishing at present an abundance of water free from danger of pollution, except the remote one of the water-closet mentioned above.

From the reservoir we walked over to Solomons Creek from which there is piped to the reservoir a supplemental supply. This originates largely in Crystal Lake whence it is piped around and over a ridge to Fairview, at which point it is poured into Solomons Creek, flows through an open conduit through the village of Mountain Top and then after leaching partly through an immense pile of coal ashes tumbles over rocks down the stream a mile or more from Fairview to the point mentioned above from which it is piped over to the Company's reservoir. This seems to be the weak point of the system, for along this part of the stream are numerous closets, some of them situated close to the stream, one especially within ten feet, and many of them quite filthy. The drainage from the village of Mountain Top must be into Solomon's Creek.

A number of closets situated in the valley of this stream are at a safe distance and in good condition, but probably eight or ten of them are dangerously near the stream. There is a small reservoir through which the water of Solomon's Creek passes, situated near Mountain Top. On the banks of this is a closet but a few feet away from the water. It has a pit, but there would be some danger of soil leaching into the reservoir. Near the point of entrance of the pipe from Crystal Lake is a shanty owned by the Lehigh Valley Railroad and occupied by a number of Hungarians, who throw their garbage, etc., where it finds its way into the creek.

This is one of the shanties mentioned in my report of January 28.

The closet is situated a suitable distance from the stream but is in bad condition. In the village of Mountain Top is one house in which occurred a case of typhoid fever in May, but the closet is supplied with a deep pit and is situated where drainage would not readily enter the stream. This supply from Crystal Lake and Solomon's Creek is not used at present, as the reservoir supplied by Pine Run is amply sufficient for all present demands.

In dry times however resort must be had to this additional supply, and whenever used there must be danger of sewerage matter finding its way into the water-pipes. The pipe leading from Solomon's Creek to the reservoir has only recently been closed, the water passing through being allowed to pass over the dam. This finishes my examination of the two systems, in the course of which I have visited nearly every house on the streams and personally inspected the closet accommodations of each.

A number of summer cottages are situated on the ridge of Wilkes-Barre mountain, the drainage from them being toward the water companies' streams, but as they are situated so far away, and the class of people who occupy them such as would allow no nuisance, it was not deemed necessary to inspect them.

In conclusion I would say that inasmuch as the cases of typhoid fever now existing in Wilkes-Barre are found almost exclusively in drinkers of Laurel Run water and not among others, the evidence points strongly to this stream as being the cause of the outbreak. That sewerage matter has entered the stream is clearly shown, but at what point it has been contaminated by typhoid fever germs, I cannot show, but that such contamination has occurred somewhere along the stream can be doubted only by the most skeptical. That such an outbreak has not occurred in the Crystal Spring region during the time that Solomon's Creek was used, is only due to the fact that the material entering it was not contaminated with typhoid germs.

You ask what measures are necessary to remove and abate the nuisance existing?

First—As regards Laurel Run. So long as the larger number of houses now existing so near its banks remain, the only safe course is to *abandon the stream entirely as a source of water supply.* This cannot be done at once, but in the meantime the reservoirs should be emptied and thoroughly cleansed and the water company ought to protect its own streams, so far as possible, from pollution, without the intervention of the State Board of Health. The offending closets near the Laurel Run depot should be at once removed, new pits dug, the contents of the old ones covered with lime and earth in such manner as to prevent any oozing into the stream. The closets at the quarries should be removed to the opposite side of the road and deep pits dug for future use. The dung heaps from the barns should be removed and any such accumula-

tion prevented in the future. The closets at the Powder works and saw mills, mentioned in the body of the report as being dangerously near the stream, should be abandoned and moved to a safe distance. The other closets supplied with boxes should be emptied oftener than once a year, at least every six months, and their contents buried securely at least a half mile from the stream. The water-company should make frequent inspections of its streams and use the most stringent measures to maintain their purity.

Secondly—as regards Crystal Spring. This supply can very readily be rendered perfectly safe, by simply piping the Crystal Lake water from the point where it enters Solomon's Creek at Fairview, around the mountain probably a mile, to the reservoir. This, I am informed, would necessitate abandoning Solomon's Creek from Fairview down, and later, the laying of a larger supply pipe from Crystal Lake to Fairview. The offending closet near Laurel Run Station should be removed, its contents buried and a deep pit dug for future use. I am informed by the superintendent of the Water Company, that steps have already been taken to accomplish this. Some of the closets along Solomon's Creek should be removed and all should be carefully watched. The closet at the house in which occurred the typhoid case, notwithstanding its safe location, should be thoroughly disinfected and its contents buried, or a new pit dug, and the closet removed; the old hole to be filled with lime and earth. I am informed by Superintendent Mitchell of the Lehigh Valley road, that the Hungarian shanty at Fairview would be torn down on August 14, and the occupants compelled to move elsewhere, so no recommendation is needed in reference to it.

I append herewith, reports of the analyses of the samples of water procured July 26.

BUREAU OF EXPERIMENT AND TESTS.
No. 413 *Locust street, Philadelphia.*

Analysis of water from Laurel Run near Oliver's powder mills, marked No. 1, Wilkes-Barre.

Analysis made July 27-August 3, 1889, by Chas. M. Cresson. M. D.
Sample received July 27, 1889. Amount of sample, ½ U. S. G.
Condition of sample, clear.
Reaction, faintly alkaline.

ANALYSIS No. 6,077.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	0.1248	35.414	2.139
Ammonia, free (NH_3),	Trace.	Trace.	Trace.
Ammonia, albumenoid,	0.0016	0.228	0.027
Nitrogen from nitrates and nitrites,	0.0250	3.570	0.428

Analysis No. 6,077.

The chemical examination of this water does not discover the presence of any material amount of hurtful matter, but the microscope distinctly shows the presence of cess-pool drainage of such character as condemns it absolutely for drinking purposes.

(Signed) CHARLES M. CRESSON, M. D.

Analysis of water from Wilkes-Barre Water Company's water reservoir.

Analysis made July 27-August 3, 1889, by Chas. M. Cresson, M. D.

Samples received July 27, 1889, amount of sample ½ U. S. G.

Condition of sample, clear.

Reaction, faintly alkaline.

ANALYSIS No. 6,078.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	0.1664	23.761	2.852
Ammonia, free (NH_3),	0.0008	0.1143	0.0137
Ammonia, albumenoid,	0.0160	0.2280	0.0270
Nitrogen from nitrates and nitrites,	Trace.	Trace.	Trace.

Analysis No. 6,078.

The chemical examination of this water does not discover the presence of any material amount of hurtful matter, but the microscope distinctly shows the presence of cess-pool drainage of such character as condemns it absolutely for drinking water purposes.

(Signed) CHARLES M. CRESSON, M. D.

If such was the condition of the water on July 26, 1889, what might it have been in June, following the severe rain storms of that month.

I desire especially to express my thanks to all of the Wilkes-Barre physicians, who so kindly gave me the list of their typhoid patients and location of each, and thereby assisted materially in getting statistics for this report. I desire also to thank B. M. Espy, Esq., secretary of the Wilkes-Barre Water Company, and Mr. Thos. H. Phillips, superintendent of the Crystal Spring Water Company, who kindly gave me information concerning their water supply.

I have refrained from discussing the causes of typhoid fever in general, with illustrations of noted outbreaks, because I have already done this in a previous report. See Report of State Board of Health for 1885, pp. 180 and 181.

(*b.*) SUPPLEMENT.

WILKES-BARRE, PA., *November* 7, 1889.

In sending you my report under date of August 10, 1889, upon the existing epidemic of typhoid fever in Wilkes-Barre, sources of water supply, etc., I stated that up to that time there had been reported 229 cases of genuine typhoid with 166 cases of malarial fever or doubtful typhoid. Since that time I regret to say there have appeared many new cases to swell the number. On September 4, I reported to the Luzerne County Medical Society, 197 additional cases for the month of August in the practice of Wilkes-Barre physicians, exclusive of cases at the hospital, which I since ascertained to be 42. Again on October 2, I reported 92 new cases for September as a partial list, as I had not heard from all of the physicians of the city. In October there were probably 40 new cases. If to these we add the estimated number for Parsons borough and Miners Mills, about fifty cases, in all about 650, occurring almost entirely among persons living in the territory supplied by the Wilkes-Barre Water Company. There have been a few cases living outside of this district, but almost all of them were persons who worked in town, or who frequently visited here and drank the Laurel Run water. There may possibly have been in all a half dozen cases that could not be definitely stated to have used the water of Laurel Run

In view of these facts, I see no reason for making any change in the conclusions expressed in my former report, viz; that the evidence points strongly to the use of Laurel Run water as the cause of the outbreak. These conclusions were based, not upon analyses of the water, nor upon imaginary theories, but simply upon this fact, that in a city and outlying suburbs supplied by two water companies, in the territory of the one supplying over two thousand inhabitants there were found six hundred and fifty cases of typhoid fever, while in the territory of

the other company which supplies nearly as large a number of people, there were practically no cases of the disease. Wherever the pipes of the Wilkes-Barre Water Company extend, there was the disease found; where they stopped, there stopped the scourge. Six hundred and fifty is probably under rather than over the true number as, no doubt, many cases were unreported.

After Laurel Run had been condemned by the unanimous verdict of the medical society, and the matter thoroughly brought to the attention of the people, many in the northern part of the city resorted to wells for their water supply, and to wells which were directly exposed to privy contamination. Many of the cases occurring in September were no doubt due to secondary infection, and were caused by the use of well water.

I have sought to discover the source of the typhoid contamination, but as yet have been unable to trace it.

There is a railroad running for some distance bordering on the stream, and at many points but a few feet away from it. It is not at all improbable that contamination from train water closets could occur. Again, Mountain Park, to which thousands seeking recreation resort during the summer, is situated very close to the divide, on one side of which the slope is directly toward Laurel Run. Sometimes excursion trains carry thousands to this park in a single day, and no doubt very many use the ground in the woods beyond this divide, and thus endanger the purity of the stream. Of course these subjects are conjectural and not proven, but the very fact that such contamination is possible strengthens the conclusions reached in my former report, that Laurel Run ought to be abandoned as a source of water supply.

As stated above, the epidemic and reports of investigation excited general interest among the people, and the large majority of the intelligent among them heeded the warning to boil the water. As a result the fever very soon abated in the central portion of the city, while it continued and increased upon the outskirts among a class of people who would not boil the water, being too poor to use ice. The attitude of the medical profession which was almost, if not entirely, unanimously in favor of the conclusions above expressed, may best be shown by quoting the action of the Luzerne County Medical Society at its several meetings.

At a meeting held August 7, after listening to a report upon the number of cases and the probable origin of the trouble, the following resolutions were unanimously adopted:—

"*Resolved*, That from the evidence this day presented there is undoubtedly a very unusual prevalence of typhoid fever in the city of Wilkes-Barre, confined almost exclusively to the people who use water from Laurel Run.

"*Resolved*, That in the opinion of this society, the water of Laurel Run has in some way become contaminated. We urge the Wilkes-Barre Water Company to empty its reservoirs, thoroughly cleanse the same and take more stringent measures to prevent contamination of the stream in the future.

Resolved, That as a precautionary measure, we urge all citizens to continue for sometime to come, to strain and boil the water used for drinking."

Six physicans who went over the ground and thoroughly inspected with me the sources of water supply, in a card published September 3, expressed themselves as in entire accord with the opinion and conclusions given in my report.

At a meeting of the Medical Society held September 4, the following resolutions presented by Dr. Mayer were unanimously adopted:—

"*Resolved*, That it is the opinion of this society, after a careful examination by many of its members of all of the ascertainable facts in regard to the recent and present epidemic of typhoid fever in Wilkes-Barre and vicinity, affecting so far at least five hundred persons, that all the cases hitherto known have been traceable to the use of infected water; that this water has been primarily that of Laurel Run, and secondarily that of well water polluted by the discharge from privies infected by the excretions of the original cases. It is manifest that no atmospheric or other influence has in this particular instance been causative of the epidemic and that no conclusion other than the above is reasonable or plausible enough to be entertained for a moment.

This society would strongly urge upon the Wilkes-Barre public the necessity of having all the water used by them for drinking or culinary purposes boiled during a half hour before using, as well as abstinence from the use of all well water.

Further we would recommend the great importance of such action and agitation as will be calculated to result in securing for the future such a copious supply of pure water as will be permanently beyond question.

Again at a meeting held October 2, the following presented by Dr. Weaver were unanimously adopted. "In view of the fact that the Laurel Run water still remains contaminated by typhoid fever germs the Luzerne County Medical Society earnestly recommends all persons using that water to boil for a full half hour all the water used by them for drinking and culinary purposes.

"Second, we recommend that the Wilkes-Barre Water Company entirely abandon for the present the use of Laurel Run water as a source of supply and that they use the wells constructed by them and supplement them if necessary by water pumped from the river, and that as soon as practicable they abandon also these sources of supply and bring all the water necessary to supply their patrons from the Susquehanna River at a point above Pittston."

Also the following presented by Dr. Davis:

"WHEREAS, a communication from the Wilkes-Barre Water Company was presented to this Society at its last meeting in which said Company through its president, expressed a willingness to empty its reservoirs, and an assurance that this would be immediately done, and

"*Whereas*, the said Company has emptied its lower reservoir and not its upper.

Resolved, That in this neglect the said company has failed to fulfil its promise and has failed in its duty to this community."

As a part of the contributions to the local press upon the subject of the epidemic, an article was prepared by George R. Wright, Esq., a director of the Wilkes-Barre Water Company, giving a layman's view of the subject and suggesting other possible causes as contributing to the spread of the disease. The causes briefly expressed are,

1. Our small and defective sewer system.
2. The possibliity of typhoid bacilli in ice.
3. Fumes from excavated streets.
4. The filled in canal and its basin or covered up big ponds.
5. Noxious gases emanating from the surface of many paved streets.
6. Impure milk."

It is proper to say here that a consideration of these various possible causes was not ignored in reaching conclusions as to the cause of the epidemic; but so much evidence being presented pointing to Laurel Run water as the cause, it was not deemed necessary to enter into a detailed discussion of what seemed irrevalent to the main question.

That these various supposed possible causes could have had no effect in the present epidemic must be apparent even to the superficial observer.

A. As regards the sewers. While they are of the small pipe, or Waring system, it is not at all certain that they are defective, the general testimony being to the contrary. But even if they were it is readily shown that they could not have been causative in this epidemic from the following considerations:

1. The fever was found as largely upon unsewered streets as upon those sewered. Canal Street *e. g.* is sewered only a short distance above North, but the disease existed largely upon the whole length of this street. The same may be said of many others.

2. Parsons borough is not sewered at all and yet fifty or more cases appeared in the borough and adjacent districts supplied with Laurel Run water.

3. That low-lying portion of our city known as Moseytown supplied with Crystal Spring water, is largely sewered but no cases appeared there, excepting in persons who worked and drank water in the Laurel Run district. The same may be said of parts of Brewing and Rolling Mill hills, the boroughs of Ashley, etc.

B. As to Bacilli in ice. A large number of the later cases appeared in the outlaying districts in the northern portion of the city among people who were too poor to use ice and who consequently did not heed the warning to boil the water. The same class of population on the outlaying districts in the opposite parts of the town, supplied with Crystal Spring water, escaped. Ice wagons from the same companies supply people in different parts of the city, *e. g.*, in the wards supplied by Laurel Run water and in those supplied by Crystal Spring. If ice cused the disease it should cause it in all parts of the town supplied by the same companies.

The same applies with equal force to the milk supply.

C. As to the fumes from excavated streets it may be said that the disease was as prevalent, in many cases more so, upon streets already paved as upon those torn up this year. Compare Canal with Academy: North Franklin with Carytown Road, and numerous other similar examples. A good illustration showing the folly of supposing the paving and excavating the streets caused the disease is found in Lincoln Street, which was torn up and paved this summer with chestnut block from Market to South Streets. That part of Lincoln from Market to Northampton is supplied with Laurel Run water; the part below Northampton, with Crystal Spring.

Up to September 1, fifteen cases were reported on Lincoln Street, of these, eleven were on the short square, supplied with Laurel Run, and the remaining four were drinkers of Laurel Run as well as of Crystal Spring water.

D. As to the filled in Canal and its basin, covered up bog ponds, noxious gases from paved streets etc., it may be said in a general way,

1. That these causes existed in previous years equally with this, (except possibly as influenced by the rainy season) and did not then cause typhoid fever.

2. The fever was not found more prevalent contiguous to these places, than in other more favored localities far removed from them. Such bog ponds did not cause the disease in the Crystal Spring district.

The more we investigate all supposed possible or probable causes the more are we forced to the conclusion that the typhoid fever epidemic in Wilkes-Barre in 1889, was caused by the use of contaminated Laurel Run water.

As a result of the agitation, the Wilkes-Barre Water Company did all in its power to correct existing abuses along its source of supply; all of the offending closets mentioned in my former report were removed and new pits dug in safer locations. The upper reservoir had been emptied in June after some of the heavy rains, but before the epidemic had fully developed. The lower reservoir was emptied and thoroughly cleaned after the request made by the Medical Society, August 7, but

the company could not at that time empty the upper reservior, because of the inability to fill the pipes and supply the town with water.

Work begun the previous year, viz., the sinking of large wells upon the opposite side of the river was now rapidly pushed forward to completion. These wells are four in number and are located about a hundred feet from the river bank; they are twenty feet in diameter and are sunk to a depth of twelve feet below low water mark of the river. They fill very rapidly with soft water of apparently excellent quality, evidently water which has filtered through sand and gravel, from the river at a point some distance above the location of the wells.

They are connected with the pump on the Wilkes-Barre side of the river, by means of two eighteen inch pipes laid on the bottom of the river. They are capable of supplying, with present pumping power, possibly three million gallons per day. The water of these wells has been in use for more than a month as a partial supply, the company not yet being willing to abandon Laurel Run entirely. But this end will we hope be ultimately reached. Two such serious epidemics in the Wyoming Valley as the one at Plymouth in 1885 and the one at Wilkes-Barre in 1889, should show us, conclusively the danger of relying upon mountain streams for water supply of cities, unless such streams can be absolutely owned and fully protected by the corporations making use of them.

The number of deaths as nearly as I can learn has been between fifty and sixty. There has been no arrangement whatever in this city prior to the month of September for securing vital statistics, and since then only in reference to causes of deaths occurring within the city limits.

The difficulties attendant upon such investigations as that which the State Board of Health, has undertaken here this summer should serve anew to impress upon all interested, the great necessity for the establishment of local boards of health. The necessary information for my reports has been obtained by personal appeal to the physicians, by visits, correspondence, etc., and has been obtained only by the sacrifice of much time and labor. Our thanks are due and cheerfully given to all of the physicians who so kindly gave all information in their posession, in reference to the number and location of cases, and who by their appreciation and encouragement helped to lighten what otherwise at times seemed a thankless task.

XVI.—INSPECTION AT HULMEVILLE, BUCKS COUNTY.

By WILLIAM B. ATKINSON, M. D., *Medical Inspector.*

In response to your instructions, I inspected the premises of Hugh B. Webster at Hulmeville, Bucks county, on August 19th.

There were about 26 pigs in the pen which were feeding upon the blood and offal brought from his slaughter house at the other end of the borough. There is no floor to the pen and the animals were wallowing in their own filth, mixed with the offal upon which they were feeding.

Mr. Webster informed me that he cleaned the place only three or four times in the year. The drainage runs out on the ground and on to a patch of truck close to it. On the occasion of my visit the odor was not very great, but every one of the neighbors whom I visited complained of it as highly offensive, on many occasions compelling them to close the windows, etc. In addition, the filth is likely to contaminate the wells.

I would suggest that Mr. Webster be directed to remove this pen to the other end of his premises; this would be outside of the borough, and sufficiently far from any of the houses so as not to cause annoyance. Then to have the place thoroughly cleaned and fresh earth filled in.

In this connection I was asked to mention the condition of the premises occupied by a Mr. Brill, and owned by Mr. Caleb Taylor. The occupant is plainly ill from the effects of his bad hygienic surroundings. The drainage accumulates in a pool close to the back of the house, the cess-pools are full and need emptying, and the entire place is unfit to live in.

XVII.—INSPECTION OF THE RANKIN TENEMENT AT BRADDOCK, ALLEGHENY COUNTY.

By J. R. THOMPSON, M. D., *Medical Inspector.*

PITTSBURGH, *September* 16, 1889.

Investigation into the Rankin station tenement house nuisance, developed the fact that the Braddocks Wire Company were more interested in having some one assume the responsibility for the removal of the dirty clothing and bedding, than they were in the prevention of disease. In other words: they wanted the "shanty" emptied, that they might put in another occupant. Realizing that these things might be this poor woman's "all in all"—that she had been reduced to the necessity of selling beer out of a few bottles, which were under her

table—that she might come out of jail penniless, I determined to save everything by boiling, which was done, with a few unimportant exceptions. Of course the ticks and pillow cases were ordered to be emptied of their straw and the straw burned. Empty ticks, pillow cases, pillow slips, blankets, clothing, etc., were boiled. It is a pity that these shanties could not all be burned, for they are in a filthy condition, or that employer would not enforce cleanliness among employés, and make it one of the conditions of continuous employment. I found workmen putting down sewer-pipe all over the town, the result of recent action of town council.

XVIII.—INSPECTION AT LOCK HAVEN, CLINTON COUNTY.

By GEO. G. GROFF, M. D., *Member of the Board.*

LEWISBURG, PA., *September 26th*, 1889.

At the request of several citizens of Lock Haven, in the capacity of chairman of the flooded districts of the Susquehanna and Juniata river, I visited Lock Haven to see, if I could, what was the cause of a reported excessive amount of sickness.

I called upon Mr. Noble, president of the late city board of health. He thought that there was no more than the usual amount of sickness in the city, and that the city was cleaner than it had been for years. He knew of but two cellars that had not been cleaned since the flood of June 1.

Mr. C. Shaffer, druggist, stated that his gold fish always die when a heavy rain occurs; and that whenever the water becomes muddy, he is markedly affected by drinking it. He thinks there is a great deal of sickness in the city.

Rev. Mr. Perkins says that water in a closed bottle, (glass stopper), smells after two or three days; that it produces diarrhœa when drunk. Mr. Perkins thinks that there is too much sickness in the city. He says that on one day there were five funerals, four of which were from typhoid fever, and that it is commonly reported that some large owners of tenement houses have refused up to this date to clean the cellars. That one owner has sixty such filthy houses.

Mr. J. B. G. Kinsloe, editor of the "Express," thinks there is a great deal too much sickness, and yet, he thinks the city is in better sanitary condition, than at any time in the previous fifteen years. But a great many people are dying of preventable diseases. Dr. Smith, a homoeopathic physician, thinks there is no more sickness than should be expected. That there is much less sickness than there was in 1865 after the flood of that year.

With Mr. Perkins, I took a carriage and drove to the city reservoirs. I found that there were two of these on a mountain side; both had burst in the June flood. The lower one had not yet been repaired; the upper one has been repaired, but is liable to break at any hour. The water here seemed clean and wholesome. I followed up the stream a half mile or more, until it branched. Just at the junction, I found a small house, occupied as a residence, about which there is no sign of any privy. I followed both streams a short distance but saw no more houses, yet some boys told me there were a number of farms at the head-waters of the streams. Unless there are farms which pollute the streams, I do not know how to account for the typhoid fever which does seem to prevail in this city.

XIX.—REPORT ON COMPLAINT AS TO THE SEWAGE DISCHARGE AT THE DEVON INN.

By HOWARD MURPHY, C. E., *Member of the Board.*

Mr. English the complainant states that the hotel people admit that 25,000 gallons of water is the daily discharge into the stream, but that he has other information that the pumpage to the hotel amounts to 36,000 gallons a day, practically all of which passes off in the form of sewage. The main drain pipe is said to contain several sumps, or something of that kind, in which the solid matter is deposited and removed at intervals, the liquid portion of the sewage passing into the stream in question. This liquid sewage looks more as if it had been strained rather than filtered and it is very clear to my mind that the contamination of the stream thereby, is absolute. Mr. English has been compelled to fence off the stream from his meadow, and cannot allow his cattle to drink this water. He also has a spring in this meadow from which water is pumped for his domestic use, the power being furnished by the stream. The difference of elevation of this spring, the stream and points along the drain pipe are so little that a study of the probable effect of the drainage upon his spring cannot be determined without an instrumental survey, but it is quite probable that this spring might be seriously contaminated by the drainage of the hotel, if not in any other way, by the overflow of the stream, during, or after, a heavy rainfall.

I consider that the proprietors of the hotel have not the slightest right to do what they are doing in this place, and that the relative values of their property and that of the country seat of Mr. English should not enter into the question.

To have the drainage of the large hotel emptied into a stream flowing through the property of even the humblest laborer—a stream on which he has full riparian rights—and so contaminate it as to render it useless to him, and offensive and unwholesome, is a nuisance which should be suppressed by law.

I might add that a clay formation, which exists in this neighborhood, seems to add greatly to the difficulty of disposing of the sewage, without admitting it to the stream.

XX.—REPORT ON THE MUNCY WATER WORKS SCHEME.

By GEO. G. GROFF, M. D., *Member of the Board.*

LEWISBURG, PA., *September 16th*, 1889.

In accordance with your request, I visited Muncy on the 14th of the present month, and made a careful sanitary survey of Glade run, and of the basin from which it is proposed to draw a water supply for the above-named place.

It is proposed to locate a pool or reservoir in the hills about three miles from Muncy, and at an elevation of 250 to 300 feet above the town. At this point, and for a quarter of a mile above, the country is covered with a primeval forest. The point selected for the pool is a narrow gorge. At the time of my visit, when the stream was full from frequent showers, I think it would about fill an eight (8) inch pipe, and not any more, and I am told that in 1881, the stream was dry for about three months and that in dry seasons it frequently ceases to run for longer or shorter periods.

The population of Muncy and vicinity, which it is proposed to supply with this water, numbers about 2,500 people.

In view of these facts, I think it would require a dam, probably not less than fifty (50) feet high, and a dam of this elevation will be a constant menace to all the people living in the valley below, which includes a portion of the town of Muncy. I am quite sure of the need of a high dam, if the work required is to be done, though I am no engineer.

Passing from the pool up the stream, at a few hundred yards, I emerged into a very broken and irregular basin, comprising from 1,000 to 2,000 acres of land, a considerable portion of which is under cultivation, and is divided into some twelve farms. In this basin Glade Run arises, being formed of a number of rivulets, which arise from some 15 or 20 springs. I found that the drainage from every one of the twelve farm buildings (houses, barn-yards, pig-styes, hen-houses, privies, etc.) was directly into these rivulets, which form Glade run, and the drain-

age from these buildings cannot be disposed of in any other way, because of the features of the region and the steepness of the hillsides, all waste is quickly carried into the course of the stream.

At a farm-house 4,400 feet from the proposed pool, I found a drain leading from the kitchen directly to the stream. The elevation of this house is about 150 feet above the pool. At one mile and 44 rods from the pool, I found a privy from which excrement was oozing. This privy was but 9 feet from the stream, and nearly vertical above it. Here also was a wash-house, all of the filth from which was discharged into the stream. The elevation above the pool about 150 feet; at another point, one mile and 22 rods from the pool, and at an elevation of 141 feet, I found a cluster of farm buildings on a *very steep hill* side, so that every thing from barn-yard, pig-pens, privy, hen-house and kitchen, went directly into the stream. Here the privy was directly over a number of springs, from which flowed a small stream to join Glade run. There were also several never-failing springs in the pig-yard, and the kitchen slops were thrown directly into the small stream which ran by the kitchen window. I found everything here in a filthy condition. At another point, about one mile from the proposed pool, I found a privy discharging a putrid stream directly into a little current which quickly runs to the pool.

I was told by one of the oldest physicians in Muncy, that dysentery and typhoid fever are not infrequent in this basin, indeed, that cases of the former occur almost every summer. In view of the fact, that all excreta not buried in the earth, must quickly pass to the pool, it seems to me that it would be a very unwise thing to permit this stream to be used as a source of water supply, if it is possible to procure from any other accessible source, a supply of pure water, and I am informed that better water can be had at a slightly increased expense. The influence of the Board should be directed to secure the purest possible supply.

I wish to add, that none of the twelve farm buildings in this basin are over two miles from the proposed pool, so that all the conditions are here present to produce just such an epidemic as decimated Plymouth a few years ago. All that is needed being a case of typhoid fever at one of the farm houses in the basin.

Work is being rapidly pushed on the works at the present time.

XXI.—INSPECTION OF BUTCHER'S RUN, ALLEGHENY COUNTY.

By BENJAMIN LEE, M. D., *Secretary of the Board.*

(*a*) COMMUNICATION FROM THE BOARD OF HEALTH OF ALLEGHENY.

CITY OF ALLEGHENY, PA., *October 3d*, 1889.

DR. BENJ. LEE, *Secretary of State Board of Health.*.

SIR:—The Board of Health of this city, at its meeting held last evening, had under consideration the sanitary condition of Butchers' run, a stream partly in the city and, partly in an adjoining township.

It appeared from the report of a committee appointed to examine the condition of said run, that it was polluted with butchers' offal and with garbage, which being exposed to the rays of the sun and to the atmosphere, decomposes, emitting a foul, offensive odor.

The remedy suggested was the construction of a sewer. This sewer would be partly in the city and partly in the township. The city, however, has no power to assess property in the township, and consequently is prevented from constructing the sewer. It is believed, however, that the State Board of Health has power to compel payment by the property owners in the township, of their proportion of the cost of constructing the sewer, when such sewer is a sanitary measure.

With the view to securing the co-operation of your Board in abating the nuisance, this Board invites you to visit the city, and in conjunction with it investigate the condition of this run, and if found as represented, to assist the city authorities in abating the nuisance.

Please advise me when it would suit you to meet with our Board on this matter.

Yours respectfully,
ROBERT DILWORTH,
Clerk of Board.

(*b*) REPORT.

EXECUTIVE OFFICE, 1532 PINE ST.
Philadelphia, October 20th, 1889.

MR. ROBERT DILWORTH, *Clerk of Councils, Allegheny.*

DEAR SIR:—In response to a request received from yourself acting on behalf of your sanitary committee, on the fourteenth day of October, in the company of Dr. J. H. McClelland, member of the State Borad of Health, and Dr. J. R. Thompson, Medical Inspector to the Board for the Allegheny district, and under the kind escort of Health Officer Bradley and several members of the sanitary committee, I made a careful inspection of Butchers' run in your city. Driving to a point above where any considerable quantity of filth can find its way into the water,

we then walked down, examining every portion of the run which was not covered over, until its termination in a well constructed brick sewer. I found constant evidence of pollution of the water by cess-pool and sink drainage, by offal from slaughter houses, fleshings from tanneries, kitchen garbage, and other offensive and putrefying materal. In fact, the run is simply an open sewer, and from the conformation of the land, it is the only and the natural sewer of the district. An open sewer of this kind in a populous neighborhood is not only a disgraceful eye-sore, but a standing source of disease to the entire community.

I condemn it as an unqualified nuisance. It should be abated before the suns of another summer have an opportunity to fill the air with its deadly emanations. The only means of abating it consist in the construction of a properly arched and graded brick sewer, similar to that in which it terminates. I urge upon the health officer and the sanitary committee, to whom I beg you to transmit this communication, to obtain the immediate consent of councils to the performance of this important work, and, inasmuch as this run forms the dividing line between the city and Reserve township, I authorize the health officer to notify all persons in said township whose properties border on said run, to unite with councils in the construction of said sewer. Failure to comply with this notification will be considered an infringement of an order of the Board and will render each party so offending liable to fine of $100.

I have the honor to be, dear sir.

Yours very respectfully,

BENJ. LEE,
Secretary.

XXII.—INSPECTION AT CONFLUENCE, SOMERSET COUNTY.

By C. L. GUMMERT, M. D., *Medical Inspector.*

BROWNSVILLE, PA., *Oct.* 15, 1889.

In obedience to your instructions on October 12, I visited Confluence, Somerset county, and by the kindness of Dr. B. A. Fitchner and J. J. Reynolds I was enabled to inspect the entire place, its dwellings, water-closets, wells, cellars, etc., and find that the state of affairs there amounts to a public nuisance. Nearly every privy vault in the town is overflowing; and the discharges from some of the typhoid cases I found exposed and lying in the gardens.

The soil is alluvial and the rains and high rivers have saturated the ground rendering the water in the wells unfit for use.

The drainage is practically valueless. I also found that under their existing law they were unable to make any headway toward getting their town in a better sanitary condition.

I therefore asked them to convene their council, when I asked that body to pass the model ordinance which they did after a rather stormy discussion. They at once organized a local board of four members, leaving the fifth or health officer to be appointed by the State Board. As they wished to commence the enforcement of the ordinance at once, therefore I appointed Dr. B. A. Fitchner health officer, to act until your Board should make the appointment.

The wells of the place will never be fit for use as they are only ten to twelve feet deep and the water is bad in taste and smell.

They propose obtaining a water supply from the hills and piping the town.

I think that the local board will in a very short time have the town in good sanitary condition.

XXIII.—INSPECTION AT WEISSPORT, CARBON COUNTY.

By CHAS. MCINTIRE, M. D., *Medical Inspector.*

EASTON, 8 *Nov.*, '89.

In compliance with your instructions of the fourth, I went yesterday to Weissport, Carbon county and made an investigation of the sanitary surroundings of the houses where there have been or are cases of typhoid fever. I find that there has been an occasional "sporadic" case, or several, every year or so, but not confined to any one part of the borough or the surrounding country; but that there had been no case since last January until the present outbreak. A single possible exception to this is that of a man who, it is said, was taken sick at Wilkes-Barre. He lived some two or three miles away from the town, and I could not find any manner of communication between his house and those who were afterwards attacked. His physician says that he was first called on the 3d of August; he was also consumptive, and died of exhaustion during convalescence. The beginning of the Weissport attack was on the 28th of August, and cases have been developing ever since. I obtained a record of sixteen well marked cases with three deaths, one of which was due to secondary causes however. There were, in addition, a number of cases of low fever but not marked enough to be included in the list. Through the kindness of Dr. J. G. Zern I was enabled to see several of the patients in various stages of the disease, or convalescing. The typical symptoms of enteric fever were

present, so that it has not been a false alarm as to the nature of the outbreak.

The cases are all in Franklin township, on the east side of the Lehigh canal, the boundary of the borough of Weissport. Most of the cases can be united in two groups, whose topographcial and geological conditions are very much alike. In the first, the houses are at the bottom of a hill, which is in part dug out to make room for the house, with the dip and strike of the rock of the hill behind them in their direction, thus favoring the drainage from the top of the hill. The other group is on the side of a gentle hill with the surface drainage toward the houses: I was unable to find any exposed rock here to determine its direction. The cases in the houses not included in either of these groups either had their places of business among the houses of the first group, or had been drinking of the water from various of the wells in that group. The water supply is from shallow wells, and the privy wells are not very far removed, with the drainage from the privy to the well, in most cases. On the top of the hill, behind group No. 1, is a school house, with its privy a little way from the brow of the hill, while the inclination of the rocks would be apt to carry the drainage from this pit somewhat south of the houses below, still it seems to be near enough for a possible contamination of two wells attached to houses where there have been several cases of typhoid fever, and one of the deaths. The only division of the house that was open was filthy from want of care, and it should be thoroughly cleansed and disinfected at once. I was informed by one of the directors that they intended to build a new one, in which case they should be recommended to build it as far from the brow of the hill as possible. Back on the hill is a cemetery, but, I think, far enough away to be harmless.

The relation between these pits for the disposal of sewage and the water supply is such that the wells all are contaminated, and if so, a menace to the health of the neighborhood; but, since this opinion would cause all of the people living in these settlements to seek another source of supply for their drinking water, at a considerable expense, I would suggest that the water of several of them be examined, so that its purity or foulness can be clearly demonstrated to them, and in the meantime, to urge them all to thoroughly boil all water for domestic use.

The School directors have closed the school, acting under pressure of some of the people who desired the children of families where there were cases of the fever quarantined. The board doubted their power to keep any child out of school, and so closed them altogether. I endeavored to show to a director that the spread of typhoid fever was not brought about by personal contact, but he seemed to desire some opinion in writing, so that they would have some authoritative state o show as a reason for opening the schools. If you would write

to the secretary of their board, Mr. Thomas Farner, P. O. Weissport, I think it will allay this useless alarm.

I have sent to the physicians of Weissport all of the circulars on typhoid fever that I had, and would be pleased to have some more.

XXIV.—INSPECTION OF TROUT RUN, LYCOMING COUNTY.

By E. D. PAYNE, M. D., *Medical Inspector.*

TOWANDA PA., *September 13th*, 1889.

In obedience to your order of the 5th inst., I have made a thorough and careful inspection of the village of Trout Run, Lycoming county, Pa., making a house to house inspection in certain districts.

The village is situated a little to the north of the center of the county, near the junction of Trout run station with the Lycoming creek, in a narrow valley, with the hills rising 600 to 800 feet on either hand, and containing 200 to 300 inhabitants.

The Northern Central Railroad passes directly through the place, and from its track the village may be divided into that portion which lies nearly on a level with it to the right, and extending up to the foot of the hills, to the eastward. At the time of the June flood the water entered the cellars in this section to a depth of one to two feet, and in subsiding, left a deposit of sediment behind. But still further to the right, and on two streets parallel with the railroad, which are situated along the hillside, the cellars were also washed, which must have been by the water coming down the side of the hills.

Trout Run, which in ordinary times is only a brooklet, flows at nearly right angles across the center of the village, passes on through low ground, and makes an obtuse angle with Lycoming creek. At the time of the flood the run was enormously swollen, carrying along debris and earth in its course, washing away the wagon road bridge, and deluging that portion of the village which lies above the run and to the left of the railroad. This portion is built on low ground. The street running parallel with the railroad, may be called Railroad street, and is only built upon the western—that is, the lower side—a street known as Mill street, running at right angles to Railroad street, is built on both sides. It was through this portion of the town the flood did the greatest damage, filling the cellars with water and leaving behind at the subsidence of them a thick deposit of foul smelling earth.

The soil is dark red earth, sand and gravel, and very porous. Nearly all the houses have been supplied with water from driven wells, situated either in the house or at the back door.

In that part bounded by the run to the southward, the railroad to the eastward, and Mill street to the northward, the houses are near together and the vaults not more than fifty feet from them. At one point four vaults, a pig-pen and stable, were all huddled together. It was here that I think the infection started, as I shall try to show. On the north side of Mill street the lots are much deeper, and the vaults 75 to 100 feet from the houses.

A hotel is situated a short distance north of the run, on Railroad street, called the Travellers' House. In this house were two cases of typhoid fever in 1881, either brought there from a Camp-meeting, or developing after coming there. There were other cases scattered through the village during that season, which were either brought from the original source of infection or contracted after the fever appeared in the place. In all these cases the discharges from the bowels of the sick were deposited in the vaults without being disinfected. At the hotel above mentioned, this was the case. There was also a case at the same hotel in 1884, the discharges from which were emptied in the same vault. At the time of the flood this vault had not been cleaned for many years; probably not since it was first dug. It is also probable that many other vaults in the village were in a state of infection at the same time. In this particular instance of the hotel vault, it was found after the flood that it had been more or less thoroughly cleaned of its contents; other vaults had shared the same result, to some extent. The water, holding this excrement in suspension, had flooded the whole of this part of the village, filling the cellars, saturating the ground, and contaminating the driven wells from which nearly every family derived its water. I saw what had been a valuable spring, on the property of G. W. K., in this locality, now ruined and still containing evidence of excrement from the vaults. On the subsidence of the waters, there remained a large deposit of filthy smelling earth in the cellars and on the ground, and this was undisturbed until after the fever made its appearance, about the middle of August. Even then there was not a general cleaning until complaint had been made to the State Board of Health.

It would seem unnecessary to enlarge this report by citing the individual cases and tracing each one to the source of infection. I did this in every case except one, to my satisfaction; and in that case, which resulted fatally, I am in doubt. Mrs. Henry G. lived on Railroad street some distance south of the run, and on higher ground than the infected district; she had no known direct communication with it. She was taken sick August 17th, and suddenly died of perforation, at a time when she was thought to be doing well, after being sick about three weeks. Up to within two or three weeks of the time of being taken sick, (could not definitely ascertain the time) she had been in the habit of getting water from a dug well about 200 feet to the

north of her residence, in a direct line on the same level. About 200 feet up the hill, in a direct line, with the well on ground about 25 feet higher, is an old vault, into which typhoid excrement is known to have been deposited in 1881. I think it would not be unreasonable to suppose the well might be contaminated from the vault, when the character of the soil is taken into consideration and it is remembered that until the present series of cases the discharges were not disinfected. If the question be asked why were not more cases infected from this well, if the well itself was infected, it may also be asked why were not more cases seized with fever who drank water from the wells near the Travellers' House. But an element of doubt comes in the case, from the fact that she had made a number of visits to Williamsport since the flood, and it is not known to what infection she may have been exposed in that city.

It seems to me there are three points for consideration, in determining the origin of these cases, viz: 1. Are they to be attributed to the flood leaving behind an unspecific but filthy deposit? 2. Has a typhoid element, undefinable in its nature and only evidenced by an occasional case since 1881, prevailed in this locality? Or, 3, is it due to the distribution of germs, by the flood, which have lain dormant for years? I am not yet ready to accept the supposition of Dr. Edwards on page 456, Annals of Hygiene for September 1889, under which the first proposition might be placed. Even after a large number of cases had been cited, the question would come, could it positively be proven that the flood in its course had not washed out a single infected vault, perhaps miles away? So I reject No. 1, as not probable. I admit the probability of No. 2, in so far as that a typhoid element has existed in the locality, but deny that the nature of it is intangible, and claim that it is explicable by the facts which would support No. 3. On this I rest, even though it brings to the front a very important question, viz: How long can typhoid germs retain their vitality? It seems to me the June flood might furnish a large amount of evidence on this point.

There were nine (9) cases of fever up to the date of my inspection on the 10th inst., two of which proved fatal. There were also four cases of cerebro-spinal meningitis, in children of one family, two of which proved fatal. The first case of fever originated near the hotel mentioned, and all but two were in the locality above the run and below the railroad. Of those two exceptions, one, on high ground, could be directly connected with the infected locality, and the other was the case of Mrs Graham, mentioned above. The cases of cerebro-spinal meningitis, occurred on Mill street; the nature of the disease being demonstrated by post-mortem examination. Before my visit a very general cleaning up had been effected, and in three instances a partial

one. The owner of the hotel property, house adjoining, and vaults, had claimed that it was the duty of his tenants to do so, while they claimed he should. Before I left he promised it should be done at once. I required a thorough cleaning of the cellars and vaults, and disinfection until frost. Mr. G. W. K., owner of an adjoining property, claimed Mr. E.'s vault had ruined his spring and filled his cellar with filthy mud. His cellar had been partially cleaned. He was away from home, but I left a letter, telling him I expected the cellar and spring to be cleaned at once, and the cellar kept disinfected till frost. I think it will be done. At some distance back of the Trout Run House, just below the stream, I found a disused but obnoxious slaughter-house. The proprietor of the house promised to clean up the place, burn the debris, and thoroughly disinfect. Generally through the place I found the cellar bottoms still damp and sometimes a little muddy, but abundantly sprinkled with chloride of lime and copperas; sometimes one, sometimes the other, sometimes both. In every instance I required the bottoms to be again scraped with a hoe, and disinfectants to be kept up till frost.

The driven wells are now practically abandoned, and an effort will be made for artesian wells or to supply water in pipes from living springs. As there is no borough organization, this must be a matter of private enterprise.

I found a very general desire not only to receive advice, but to see authority. I had about a dozen copies of Circular No. 18 with me, which I distributed and requested the recipients to pass among the neighbors.

XXV.—INSPECTION AT NEW BETHLEHEM, CLARION COUNTY.

By SPENCER M. FREE, M. D., *Medical Inspector.*

BEECHTREE, PA., *November* 26, 1888.

DEAR SIR:—At the request of the council of New Bethlehem, I visited their town and made a pretty thorough examination of it. I met the council or other citizens at night, and talked to them about their place, the water supply, drainage, etc.

I suggested to them the origin of the diphtheria then prevalent, and how to get rid of it. The next morning I again met the council. They ordered one thousand copies of the circular, Precautions against Diphtheria, printed and circulated at once, and all houses where the disease existed to be quarantined. They asked the school directors to require a certificate from every scholar attending school that no diphtheria had been in his house for one month. I wanted them to say two

months, but they thought best to say one month. They selected certain citizens and created them a board of health, acting as a committee for the council. They asked them to organize according to the form laid down by the state, to pass all rules that they thought necessary, and to suggest such measures as they deem important for the sanitary improvement of the village. When this report came before the council they intended to ratify it in full, and make it the legal act of the council.

I am told that the board is doing good work already. I visited almost every house where diphtheria had been, and traced every case to its origin. The water supply is *very* poor. The soil is loam for six inches, and then sand for twelve or fifteen feet. Until recently, well water was the only supply; now they have a water company obtaining water from the creek. This supply cannot remain pure long. I advised the sinking of a deep well, say five hundred feet, the casing of it to near the bottom, and the distribution of this to the people.

XXVI.—INSPECTION OF THE METHOD OF PURIFICATION OF WATER AT ANTWERP, BELGIUM.

By J. H. McCLELLAND, M. D., *Member of the Board.*

The subject of a pure water supply for our cities and towns is one of increasing importance, as the sources of this supply become more and more contaminated by increasing population.

We may as well admit in the beginning that for most cities and towns we must depend upon the rivers and adjacent streams for the water supply inasmuch as wells sunk for the purpose prove inadequate for cities of any size.

The purification of rivers loaded with sewage by oxygenation in their natural course has also proven to be highly problematical, and so we are driven to the alternative of drinking impure water, or the expedient of purification.

The problem to be solved plainly is, can purification of water be accomplished in a practical manner and on a scale of sufficient magnitude to supply large masses of population with wholesome drinking water, using the ordinary sources of supply, and by a method which shall ensure a continuity of operation at moderate cost.

Nothing short of these requirements will meet the demand, and nothing short of them should satisfy any municipality whose water supply is not up to the standard of purity.

It is in the interest of this inquiry that your delegate set about investigating some of the water systems of Europe. This report, however, confining itself to a notice of one method—which finds its most

perfect development in the system by which the City of Antwerp is supplied with abundance of pure water.

This system is known as *the method of water purification by metallic iron*, a method by no means new, but which has been brought to a state of perfection approximatively, in a practical every day way in the city of Antwerp and other European cities of considerable size.

An important mission of this Board is to furnish the people of the commonwealth with information pertaining to health and longevity, and I trust my efforts will prove suggestive in this direction.

With this end in view I made an investigation of the Antwerp system and was kindly aided by our American Consul, Colonel Stewart, formerly of Pittsburgh, who made me acquainted with Mr. E. Devonshire, chief engineer of the water company.

Mr. Devonshire very cordially entered into an explanation of their method and at once made an appointment with me to visit the works at Malines, some ten miles out of Antwerp, in company with Professor Ad. Kemma, the very able chemist of the company, and a member of the Faculty in Antwerp.

In the hands of these gentlemen the task was not only easy but very pleasant. I might mention, parenthetically, that I have had the pleasure of meeting also Mr. Samuel Tomlinson, chemist of the municipal department of Bombay, who had come on the same errand as myself, showing how the ends of the earth may come together on matters of mutual interest.

We first noted the narrow sluggish river Nethe from which the water supply is drawn and shuddered to think of drinking so vile looking a compound. The river was low and the banks offered to view a surface covered with green slime. Now, following up the conduits we came to the filtering apparatus and thence along to the reservoirs, noting the changes as we went, until finally, we were shown the beautifully clear limpid water as delivered to the fortunate citizens of Antwerp. If all the cities of Europe were similarly supplied, I fear there would be less excuse for the average American traveller who must needs have recourse to the "wines of the country" for the deleterious effects of the drinking water.

Without attempting at this time a description of the apparatus and the details of the method, it may be said in general terms, that it is simply the *method of water purification by metallic iron*, an idea by no means new in itself, but which, in this case, had been taken hold of by practical men in a practical way.

Chemists and other scientific men were called upon to supply the idea, but the practical engineers of the company put their wits to work and, regardless of cost, for the cost was great, brought the machinery and other details of the process to its present state of perfection. The essential feature of the process is that water is passed through a revolv-

ing cylinder which contains a quantity of small pieces of metallic iron, so that the iron is thrown in contact with the water, instead of the water passing through the iron, as was formerly done, a very important difference.

An important advance, it may be mentioned, in the use of iron as a purifier, was the "spongy iron" invented some twenty-five years ago by Prof. Bischof, but the very effectiveness of this material as a filtering agent (as of most good filters) proved the greatest barrier to its use on a large scale (or small one either for that matter), because the pores soon became filled and thus defeated the very object it was to subserve. The renewal of this spongy iron sufficiently often was practically impossible and so what promised to be a royal highway out of the difficulty, proved to be the direct road to a failure. The engineers, however, were not to be baffled, but consulted Sir Frederic Abel, C. B., F. R. S., an authority upon the subject, who confirmed the use of iron as the best and most harmless substance known for filtering purposes, but suggested as a way out of the difficulty that by some means *the iron must be thrown in contact with the water*. This idea was seized upon by Mr. Anderson, the practical head of the company, which constructs the filters, and he soon had in operation the present method by revolving cylinders. It was indeed a mighty achievement in hydraulics, and the question as to how pure, wholesome and palatable water was to be obtained, was at last solved.

The chief points of advantage to be considered in connection with this method, are:

First. The water is rendered absolutely pure and free from all extraneous matters; germs, bacilli, etc., which is by all means the most important point.

Second. The process is exceedingly simple and the cost of the plant and its subsequent operation very small.

Third. The means employed are perfectly harmless, which is not the case with most of the effective filtering materials, especially the chemical ones.

Fourth. The material here used should certainly commend itself to our iron commonwealth.

But the authorities on the other side of the water take nothing for granted, and so in Antwerp as in other cities where this process is in use, a most thorough examination of the water is required weekly, and as I have been kindly furnished by Mr. Devonshire with copies of the official reports, I feel that they should appear herewith, as confirmatory of what has been said:

First Quarterly Report, 1889.

ANTWERP, *May 8th*, 1889.

The undersigned, Ch. Blas, Professor at the University of Louvain; A. Jorissen, Professor at the University of Liége; Ch. Swarts, Profes-

sor at the University of Ghent; E. Van Ermengem, Professor at the University of Ghent, have separately carried out a series of weekly analyses of water of the Antwerp water supply during the first quarter of the year, 1889.

The following results have been obtained:

Residue on evaporation, 0.140 gr. to 0.193 gr. to the litre.

Chlorine, 0.015 gr. to 0.016 gr. to the litre.

Organic Matter, [Kubel's method], 0.027 gr. to 0.053 gr. to the litre.

Ammonia, [direct process], none.

Free Ammonia, [Wanklyn's process], trace.

Albumenoid Ammonia, [Wanklyn's process], 0.00009 gr. to 0.0001 gr. to the litre.

Sulphuric Oxide 0.003 gr. to 0.020 gr. to the litre.

Nitric Acid, 0.000 gr. to 0.003 gr. to the litre.

Nitrous Acid, none.

Total Hardness, 7.5° to 11°.

Taste and Smell, normal.

Flavour, that of very soft water.

Bacteria, number of colonies per cubic centimetre after four days, from 31 to 140, no pathogenic micro-organism or any of a suspicious kind.

The results obtained by chemical analysis prove this water to be of irreproachable purity and of excellent quality, both for drinking and industrial purposes.

The bacteriological analysis allows it to be affirmed that the water is perfect from a hygienic point of view, containing hardly more microbes than spring water in general, and no microbe of a dangerous or suspicious nature.

Signed: SWARTS, VAN ERMENGEM,
JORISSEN, C. BLAS.

Second Quarterly Report, 1889.

ANTWERP, 10*th July*, 1889.

The undersigned having separately carried out weekly analyses of the water of the Antwerp supply during the second quarter of the current year, state that this water has maintained its good quality mentioned in their first Quarterly Report, both as regards its organoleptic character, [*i. e.*, colour, taste, or smell,] and its chemical and microbiological character. When taken immediately on leaving the filters working in their normal way, and before any ulterior contact with the air, the water contains from four to six microbes per cubic centimetere, *a fact which places it on a par with the purest and most healthy spring water*.

These results are the more remarkable as they have been obtained during the period of summer heat, when the water of the river was un-

dergoing a marked change for the worse. They demonstrate the efficiency of the system of purification applied at Waelhem.

Signed: SWARTS, VAN ERMENGEM,
JORISSEN, C. BLAS.

It may be explained in connection with the above that the purest spring water known contains more free ammonia and other organic elements than the above analyses show as existing in Antwerp water as drawn from the city taps.

It may be further stated that soon after this method was put into operation a series of experiments, some two-hundred in number, were made to test its measure of success in purifying waters of all degrees of badness.

These were conducted by Sir Frederick Abel, Drs. Frankland and Tidy, and Mr. G. H. Ogston, F. C. S., of England; M. Marie Davy, Director of the Observatory of Montsouris, at Paris; by Profesors Swarts, Blas, Angenot, Kansas, and Jorissen of Belgium, and other eminent chemists, by which it was proved that this process of purification by iron, in the revolving cylinders, reduced the organic matter in waters from forty-five to eighty-five per cent. according to circumstances. The albuminoid ammonia was reduced from fifty to ninety per cent., while the free ammonia was completely eliminated.

Since that time, the machinery having been further perfected, the astonishing results as indicated in the above official reports have been reached.

The systematic efforts of such companies as the Anderson company seem necessary to the success of any great project for the public weal, for the public seem very slow in availing themselves of any scheme for the general good unless it comes to be the interest of private enterprise to force it upon their attention. I am satisfied that this method of water purification by metallic iron is the best yet devised and it only remains for the people to adopt some such system as this, and the great problem of a pure wholesome water supply is solved.

APPENDIX C.

ANNUAL REPORTS OF CITIES AND TOWNS.

I. Report of the Health Commissioner of York.
II. Report of the Board of Health of Meadville.
III. Mortuary Tables, etc., of Philadelphia.
IV. Special Ordinance of the Borough of St. Petersburg.
V. Report of the Board of Health of Reading.
VI. Report of the Board of Health of Scranton.
VII. Report of the Board of Health of Titusville.

I.—REPORT OF THE HEALTH COMMISSIONER OF YORK.

To the State Board of Health.

GENTLEMEN:—I have the honor to lay before you the report of the work done by me during the year 1888. Before entering upon the statistical part of the work we should congratulate ourselves upon the fact that no serious epidemic occurred in our city. In the latter part of July, fever designated by different names by the attending physicians started and it was feared that we were in danger of having an epidemic of what many termed typhoid fever. Immediate steps were taken to have the neighborhood where these cases existed cleaned up of all things that were likely to produce the disease and every precaution taken to prevent its spread, resulting in the fact that if it were an epidemic it was a very small one. The tabular statements will show the number of deaths. Diphtheria has been lurking around the city during the whole year, being most severe during the months of November and December, but I do not consider it as epidemic. However, there have been so many deaths from it that it behooves parents and school teachers and our pastors to be on their guard. Three hundred and forty complaints of nuisances were made, consisting as usual of ter closets, slaughter houses, hog pens, filthy gutters, bad drainage the accumulation of filth in private alleys. In so far as it was pos- al huge evils were removed or remedied. My thanks are due the s kind assistance, to the sanitary committee for their cour- he police for the prompt service of notices. We have reliable statistics until now, and our board of trade to build up our city and its industries, can now show

to capitalists by actual figures, and to those who seek healthful homes, that York will compare with the best and thus offer them the inducement that with us epidemics are rare and our percentage of deaths small.

VITAL STATISTICS.

Deaths occurred during the year from the following diseases:

Abscess	2
Abscess of stomach	1
Abscess of liver	1
Angina pectoris	1
Apoplexy	9
Apnœa	1
Asthenia	1
Asthma, spasmodic	1
Atelectasis, pulmonum	1
Bowels, obstruction of	1
Bright's disease	5
Bronchitis, acute	3
Bronchitis, chronic	3
Bronchitis, capillary	1
Calculus in bladder	1
Cancer, diffused	3
Cancer, of liver	1
Cancer, of rectum	1
Cancer, of stomach	1
Cancer, of throat	1
Catarrh, intestinal	2
Catarrh, pulmonary	1
Cellulitis	1
Chorea, rheumatic	1
Child birth	2
Cholera infantum	27
Compression of brain	1
Convulsions	10
Congestion of brain	3
Congestion of liver	2
Consumption of bowels	1
Consumption of lungs	26
Croup	3
Croup membranous	1
Cyanosis	2
Diabetes	1
Diarrhœa	5
Diarrhœa chronic	1
Diphtheria	21

Disease of heart	14
Disease of hip	1
Disease of liver	2
Disease of mesenteric glands	1
Dropsy, general	4
Dysentery	1
Encephalitis	1
Enlargement of heart	1
Enteritis	1
Enteritis, chronic	1
Enteritis, sub acute	2
Enteritis, tubercular	1
Entero colitis	1
Fatty degeneration of the heart	1
Fever, malarial	2
Fever, puerperal	1
Fever, remittent	8
Fever, typhoid	18
Fever, typho-malarial	6
Gangrene	1
Gall duct, obstruction of	1
Gastritis	1
Gastritis, chronic	1
Gastralgia	1
Hæmaturia	1
Hemorrhage	1
Hemorrhage of brain	1
Hepatitis	1
Hernia, abdominal	1
Hernia, umbilical	1
Hernia, strangulated	1
Ileo—colitis	2
Imperfect development	1
Inanition	2
Indigestion	1
Inflammation of brain	2
Inflammation of bowels	2
Inflammation of Eustachian tube	1
Jaundice	2
Laryngitis, pseudo membranous	2
Mal-nutrition	1
Marasmus	5
Measles	16
Meningitis	1
Meningitis, cerebro-spinal	2

Meningitis, tubercular	3
Menopause	1
Nephritis	1
Old age	12
Paralysis	9
Pericarditis	1
Pertussis	2
Peritonitis	1
Pleurisy	1
Pneumonia	16
Pneumonia, broncho	4
Pneumonia, typhoid	1
Premature birth	6
Rheumatism	2
Rheumatism, sub acute	1
Scalds	1
Scrofula	1
Septicæmia	1
Stomatitis	1
Still births	11
Synovitis	1
Tetanus	2
Thrombosis	1
Unknown	1
Unknown, infantile	2
The deaths registered in the ten months include:	
Under 1 year	93
Between 1 and 2 years	23
Between 2 and 5 years	31
Total under 5 years	147
Between 5 and 10 years	22
Between 10 and 15 years	9
Between 15 and 20 years	13
Between 20 and 30 years	25
Between 30 and 40 years	19
Between 40 and 50 years	19
Between 50 and 60 years	19
Between 60 and 70 years	27
Between 70 and 80 years	34
Between 80 and 90 years	15
Between 90 and 100 years	1
Adult, males	70
Adult, females	93
Boys.	102
Girls	85

DEATHS IN EACH WARD.

First	30
Second	22
Third	29
Fourth	35
Fifth	64
Sixth	29
Seventh	39
Eighth	22
Ninth	64
Tenth	26

NATIVITY OF DECEASED.

United States (white)	309
Foreign States (white)	33
People of color	8
Inquest cases	5

BIRTHS REPORTED.

Males	164
Females	118
Total	282

This shows that all the births have not been reported.

Population estimated by police census to the 8th of December, 1887, 20,545.

Total deaths, exclusive of still born, 339.

Annual death rate per 1,000 during the 10 months was 16 5-10.

There were brought to the city from other places the bodies of 36 persons for interment, making a total of 386 persons buried from York.

CASH ACCOUNT.

Number of burial permits issued	386
Nnmber of water-closet permits issued	460
Number of hog-pen permits issued	194
Total number of permits issued	1,040
These permits should realize the sum of	$260.00
Deposited with City Treasurer	259.50
Balance due	50

Respectfully submitted,

W. J. McCLURE,

Health Commissioner.

II.—OFFICIAL CIRCULAR OF THE BOARD OF HEALTH OF THE CITY OF MEADVILLE.

Again an appeal is made to the citizens of Meadville by those charged with the responsibility of securing and maintaining a good sanitary condition of the city, for assistance in their efforts to secure such a condition. Much can be done by those to whom has been intrusted the immediate supervision of the health of the city; but without the co-operation of every landlord and tenant their efforts must be much less efficient. Valuable assistance can best be rendered by a cheerful observance of the following rules and regulations adopted by the present board of health, and which, according to law, have the force of ordinances of the city, with like penalties for their violation.

Rules and Regulations.

1. Every cellar, sink, cess-pool, privy, drain, etc., must be kept thoroughly cleansed and disinfected.
2. All refuse vegetable or animal matter must either be buried or removed from the city limits.
3. All old papers, straw, sawdust used in packing or otherwise, must be burned.
4. Green grocers must not expose for sale, or permit about their premises, decayed or decaying vegetables.
5. No water from kitchens, slops of any kind, or impure water or matter shall be emptied by drains or otherwise upon the streets or alleys of the city.
6. No refuse vegetable or animal matter shall be thrown into any stream or pond.
7. The carcasses of horses, cattle and dogs shall not be buried within the city limits.
8. No privy vault or cess pool shall be emptied or drained without the consent of the health officer.
9. All information and facilities for investigation must be given to the sanitary police, whose duties are to ascertain whether anything has been left undone about premises which is necessary to do to remove all possible source of contagion.

The board also recommends that the open ends of all waste pipes from wash basins, tubs, sinks, etc., connected with drains and sewer be frequently disinfected, either by passing large quantities of hot water through them or by some approved disinfectant.

The Board recommends as a disinfectant for general purposes "The Standard Solution No. 1," of the State Board of Health, of Pennsylvania, which is made as follows:

Dissolve best quality of chloride of lime or bleaching powder in soft water in the proportion of four ounces to the gallon.

This disinfectant has stood the test of time and the most rigid scientific experiments, and is also recommended by its cheapness and safety as well as its efficiency.

JOHN C. COTTON,
Health Officer.

D. V. DERICKSON, *President.*
JAMES GRAHAM,
JACOB SCHOEMAKER,
F. SHAUWEKER.

III.—CITY OF PHILADELPHIA—EXTRACTS FROM THE HEALTH OFFICER'S ANNUAL REPORT OF BIRTHS, MARRIAGES AND DEATHS, FOR THE YEAR 1888.

By WM. B. ATKINSON, A. M. M. D.,

The number of births registered during the year amounted to twenty six thousand two hundred and ninety-six (26,296), being an increase over the previous year of two thousand one hundred and eighty-three (2,183).

The number of marriages was six thousand seven hundred (6,700), showing an increase of three hundred and forty five (345) over the previous year.

The number of deaths amounted to twenty thousand three hundred and seventy-two (20,372), a decrease of one thousand three hundred and forty-seven (1,347).

The following table shows the ratio of deaths, with population for the past twenty eight years.

YEARS.	Population.	Deaths.	Death to 1,000 persons living.	Persons living to one death.
1861.	576,408	13,540	23.49	42.57
1862.	587,287	13,684	23.60	42.36
1863.	598,166	14,220	23.72	42.06
1864.	608,045	15,875	26.10	38.30
1865.	618,924	15,633	25.25	39.59
1866.	630,803	15,362	22.80	40.99
1867.	640,682	12,660	19.76	50.69
1868.	651,561	13,391	20.39	48.65
1869.	662,440	13,428	20.27	49.33
1870.	*674,022	15,317	22.72	44.00
1871.	700,000	15,485	22.12	45.20
1872.	725,000	18,987	26.19	38.18
1873.	750,000	15,224	20.29	49.26
1874.	775,000	15,238	19.66	50.86
1875.	800,000	17,805	22.25	44.93
1876.	825,594	18,892	22.88	43.69
1877.	850,856	16,004	18.81	53.16
1878.	876,118	15,743	17.97	55.65
1879.	901,380	15,473	17.17	58.25
1880.	*846,980	17,711	20.91	47.82
1881.	868,000	19,515	22.48	44.47
1882.	886,539	20,059	22.62	44.19
1883.	907,041	20,076	22.13	45.18
1884.	927,995	19,999	21.55	46.40
1885.	949,432	21,392	22.53	44.38
1886.	971,963	20,005	20.59	48.55
1887.	993,801	21,719	21.85	45.75
1888.	1,016,758	20,372	20.04	49.90

*U. S. census—the intervening years population estimated.

The following comparative table will show the mean temperature of the summer months for the past thirteen years.

MONTHS.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.
June, ...	42.2°	71.7°	67.9°	71.7°	73.8°	67.1°	72.9°	73.7°	70.5°	70.6°	68.6°	70.9°	72.6°
July. . . .	78.6°	77.8°	77.3°	75.6°	75.6°	75.5°	77.4°	76.1°	71.8°	77.2°	74.6°	79.7°	72.1°
August, . .	74.3°	75.5°	73.4°	72.7°	72.8°	75.0°	73.9°	71.9°	72.5°	71.8°	73.2°	73.0°	73.6°
September, .	68.8°	68.8°	67.9°	64.4°	67.7°	74.8°	69.1°	64.5°	70.6°	65.2°	69.2°	64.0°	63.6°
Mean, . . .	72.72°	72.95°	71.62°	71.10°	72.47°	73.10°	73.32°	71.5°	271.3°	71.2°	71.4°	71.9°	70.5°

The deaths from diphtheria amounted to three hundred and fifty (350), being 1.71 per cent. of the total mortality, and a decrease of sixty-six (66) from those of the previous year. The deaths from scarlet fever amounted to two hundred and thirty-five (235), being 1.15 per

cent. of the total mortality, and an increase of seventy-six (76) over the previous year.

	Diphtheria.	Scarlet fever.
First quarter,	108	60
Second quarter,	72	37
Third quarter,	52	28
Fourth quarter,	118	110
Total,	350	235

The following comparative table shows the number of deaths from each disease for the past twenty-one years.

YEAR.	Diphtheria.	Scarlet fever.
1868,	119	224
1869,	182	799
1870,	172	956
1871,	145	262
1872,	150	174
1873,	110	319
1874,	179	461
1875,	652	1,062
1876,	708	328
1877,	458	379
1878,	464	554
1879,	321	336
1880,	323	291
1881,	457	486
1882,	933	310
1883,	1,006	561
1884,	680	540
1885,	600	375
1886,	411	248
1887,	416	159
1888,	350	235

BIRTHS.

The number of births registered during the year amounted to twenty-six thousand two hundred and ninety-six (26,296), an increase over the previous year of two thousand one hundred and eighty-three (2,183); the ratio of births to population being 25.86 per thousand, or 1 in each 36.8 persons.

The number of male children amounted to thirteen thousand seven hundred and eighty-two (13,782), and of females to twelve thousand five hundred and fourteen (12,514).

The number of illegitimate births reported amounted to six hundred and forty-nine (649).

1888.	Total.	BIRTHS.		BLACK.		STILL-BORN.		Twins.	Triplets.	Illegitimate.
		M.	F.	M.	F.	M.	F.			
January,	2,337	1,214	1,123	41	39	64	50	23	...	39
February,	2,152	1,127	1,025	36	22	62	35	28	...	57
March,	2,157	1,137	1,020	35	36	58	38	25	...	46
April,	1,762	942	820	26	22	46	34	21	...	46
May,	1,876	956	890	31	30	57	40	24	...	51
June,	2,162	1,112	1,050	45	28	57	34	27	...	63
July,	2,349	1,251	1,098	44	34	63	26	24	...	64
August,	2,356	1,233	1,123	43	28	67	43	33	...	58
September,	2,336	1,219	1,117	44	38	48	31	25	...	59
October,	2,326	1,196	1,130	37	25	55	49	32	1	54
November,	2,232	1,153	1,079	35	26	64	49	26	2	59
December,	2,251	1,212	1,039	42	38	42	27	26	...	53
Totals,	26,296	13,782	12,514	459	366	683	450	314	3	649

The number of births in each quarter of the year was as follows:

First quarter, ending March 31,	6,646
Second quarter, ending June 30,	5,800
Third quarter, ending September 30,	7,041
Fourth quarter, ending December 31,	6,809
	26,296

The following table presents the births in each ward during the year 1888.

BIRTHS IN EACH WARD, 1888.

First,	1,475	Twelfth,	396	Twenty-third,	684
Second,	738	Thirteenth,	476	Twenty-fourth,	1,409
Third,	449	Fourteenth,	493	Twenty-fifth,	1,745
Fourth,	782	Fifteenth,	1,297	Twenty-sixth,	1,468
Fifth,	398	Sixteenth,	511	Twenty-seventh,	853
Sixth,	254	Seventeenth,	613	Twenty-eighth,	1,504
Seventh,	621	Eighteenth,	746	Twenty-ninth,	1,408
Eighth,	278	Nineteenth,	1,717	Thirtieth,	890
Ninth,	239	Twentieth,	1,064	Thirty-first,	865
Tenth,	477	Twenty-first,	654	Unknown,	229
Eleventh,	414	Twenty-second,	949	Total,	26,296

MARRIAGES.

The number of marriages registered during the year was six thousand seven hundred (6,700), or about one person married in 75.87—an increase of three hundred and forty-five (345) over the previous year.

First quarter, ending March 31,	1,398
Second quarter, ending June 30,	1,979
Third quarter, ending September 30,	1,423
Fourth quarter, ending December 31,	1,900
	6,700

The following table gives the birth place of those married:

Nativities of the Parties.

NATIVITIES.	BIRTHPLACE OF BRIDES.			Total of grooms.
	United States.	Foreign.	Not given.	
Birthplace of Grooms.				
United States	3,471	457	22	3,950
Foreign	621	1,888	3	2,512
Not given	22	8	208	238
Total of brides	4,114	2,353	233	6,700

The number of marriages in which both parties were natives of the United States was three thousand four hundred and seventy-one (3,471); those in which both parties were foreign born amounted to one thousand eight hundred and eighty-eight (1,888); and in two hundred and eight (208) cases the nativities of both parties was not given.

The number of men, natives of the United States, married during the year was three thousand nine hundred and fifty (3,950), and the number of women four thousand one hundred and fourteen (4,114); the birth place of two hundred and thirty-eight (238) men, and of two hundred and thirty-three (233) women, was not given.

The number of foreign grooms was two thousand five hundred and twelve (2,512); of women, six hundred and twenty-one (621) married natives of the United States; of two thousand three hundred and fifty-three (2,353) foreign women married, four hundred and fifty-seven (457) married natives of the United States. The following table will show the age of the parties married during the year 1888:

Ages of the Parties.

1888.	AGES OF THE WOMEN.									Total of men.
	Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Not given.	
Ages of the Men.										
Under 20	22	7	....	....	....	....	....	....	....	29
20 to 25	368	1,513	154	22	2	....	....	....	17	2,076
25 to 30	194	1,300	800	100	21	....	....	....	26	2,441
30 to 40	60	360	567	378	65	1	1	....	8	1,440
40 to 50	3	36	60	161	44	5	....	....	4	313
50 to 60	....	....	8	24	13	13	1	....	2	61
60 to 70	....	....	2	6	....	12	2	....	....	22
70 to 80	....	....	....	1	....	1	1	1	....	4
80 to 90	....	....	....	....	....	2	....	....	....	2
Not given	1	12	1	3	1	....	....	....	294	312
Total of women	648	3,228	1,592	695	146	34	5	1	351	6,700

The following table shows the ages of those married under twenty years of age:

Women under 20.

UNDER 20.	15	16	17	18	19	20	20 to 25	Total.
Men Under 20.								
17.	...	...	...	...	1	...	...	1
18.	...	1	2	1	...	...	...	4
19.	1	1	2	3	7	2	1	17
20.	...	2	1	3	...	1	...	7
20 to 25.	3	14	44	135	172	...	...	368
25 to 30.	5	11	19	60	99	...	...	194
30 to 40.	...	4	7	12	37	...	...	60
40 to 50.	...	...	...	1	2	...	...	3
Not given.	...	...	...	...	1	...	...	1
Total.	9	33	75	215	319	3	1	655

The following table will show the number of each sex in each division of age married during the year:

1888.	Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	Age not given.
Males.	29	2,076	2,441	1 440	313	61	22	4	2	312
Females.	648	3.228	1,592	695	146	34	5	1	...	351
Total.	677	5,304	4.033	2,135	459	95	27	5	2	663

MORTALITY.

Deaths during the year 1888:

White,	19,312	
Black,	1,060	
Total,		20,372
Male,	10,566	
Female,	9,806	
Total,		20,372
Male adults,	5,838	
Female adults,	5,763	
Total adults,		11,601
Male children,	4,728	
Female children,	4,043	
Total children,		8,771

Deaths from specific diseases,	18,820	
Deaths from old age,	1,050	
Deaths from violence (accidents), homicide and suicide,	378	
Deaths from unknown causes,	124	
Total,		20,372

In the above figures the still-born and premature births and bodies brought to the city are not included, thus showing the actual mortality.

The mortality of adults amounted to eleven thousand six hundred and one (11,601), showing a decrease of seventy-three (73) from the previous year, the mortality among minors amounted to eight thousand seven hundred and seventy-one (8,771), showing a decrease of one thousand two hundred and seventy-six (1,276). The number of deaths of those born in the United States was fourteen thousand eight hundred and eighty-seven (14,887); those of foreign births numbered four thousand seven hundred and twelve (4,712); those whose birth-place was not reported, seven hundred and seventy-three (773).

Abscess.—The number of deaths amounted to one hundred and ten (110), an increase of one (1) over the previous year.

Cancer.—The number of deaths from cancer amounted to four hundred and forty-eight (448), a decrease from the previous year of fifty-two (52).

Cerebro Spinal Meningitis.—The number of deaths from this cause amounted to fifty (50), an increase of five over the previous year, thirty-eight (38), of which were among minors and twelve (12) among adults.

Consumption of the Lungs.—The number of deaths reported from this disease during the year was two thousand six hundred and ninety-five (2,695), showing a per centage of 13.22 to the total mortality, or about one (1) person in seven (7), a decrease of one hundred and five (105) from the previous year. Two thousand four hundred and nineteen (2,419) of these were adults, and two hundred and seventy-six (276) minors. One thousand eight hundred and eighteen (1,818) were natives of the United States; six hundred and ninety-six (696) were foreign born, and one hundred and eighty-one (181) whose nativity was unknown.

The deaths in each month of the year were as follows:

January	267	July	186
February	256	August	213
March	246	September	171
April	231	October	247
May	292	November	181
June	199	December	206

The largest number of deaths occurred in the month of May—two hundred and ninety-two (292); and the smallest number in the month of September—one hundred and seventy-one (171).

The average deaths from this disease in each month,	224.6
The average deaths from this disease in each week,	50.2
The average deaths from this disease in each day,	7.38

The number of deaths from consumption, of both sexes, for the past twenty-seven years were as follows:

YEARS.	Males.	Females.	Total.
1862	961	988	1,949
1863	966	989	1,955
1864	1,087	1,002	1,289
1865	1,020	1,006	2,026
1866	994	950	1,944
1867	942	1,005	1,947
1868	1,000	995	1,995
1869	982	993	1,975
1870	1,118	1,190	2,308
1871	1,099	1,138	2,337
1872	1,167	1,163	2,330
1873	1,093	1,198	2,291
1874	1,133	1,171	2,304
1875	1,185	1,174	2,359
1876	1,288	1,388	2,676
1877	1,142	1,207	2,349
1878	1,154	1,337	2,491
1879	1,233	1,248	2,481
1880	1,325	1,367	2,692
1881	1,358	1,410	2,768
1882	1,382	1,427	2,809
1883	1,343	1,455	2,798
1884	1,395	1,406	2,801
1885	1,346	1,475	2,821
1886	1,468	1,366	2,834
1887	1,437	1,363	2,800
1888	1,404	1,291	2,695

Cholera Infantum.—The number of deaths so reported amounted to eight hundred and thirty-five (835), a decrease of fifty-six (56) from previous year.

Diphtheria.—The number of deaths amounted to three hundred and fifty (350), a decrease of sixty-six (66) from the previous year.

The following figures show the number of deaths from this disease for the past twenty-one years:

YEARS.	Male adults.	Female adults.	Male children.	Female children.	DEATHS IN EACH QUARTER.				
					1st.	2d.	3d.	4th.	Total.
1868	2	3	51	63	26	24	17	52	119
1869	3	5	75	99	42	48	37	55	182
1870	4	4	68	96	33	25	31	83	172
1871	3	3	71	68	48	32	29	36	145
1872	5	5	61	79	52	28	25	45	150
1873	1	2	56	51	45	25	17	23	110
1874	1	4	80	94	30	28	20	101	179
1875	6	7	314	325	116	158	142	236	652
1876	10	8	330	360	219	192	103	194	708
1877	6	7	182	263	120	97	84	157	458
1878	6	11	218	229	135	81	90	158	464
1879	6	5	141	169	130	57	46	88	321
1880	3	6	151	163	99	72	51	101	323
1881	3	8	214	232	84	83	100	190	457
1882	5	8	442	478	187	162	203	381	933
1883	1	9	511	485	267	218	230	291	1,206
1884	5	6	330	339	196	112	114	258	680
1885	3	10	282	305	204	120	111	165	600
1886	6	4	159	242	136	84	91	100	411
1887	5	5	192	214	67	88	94	167	416
1888	6	8	166	170	108	72	52	118	350

Fever, Scarlet.—The number of deaths from this disease amounted to two hundred and thirty-five (235), an increase over the previous year of seventy-six (76).

The deaths in each month of the year were as follows:

January	26	July	8
February	24	August	13
March	10	September	7
April	12	October	34
May	13	November	37
June	12	December	39

Typhoid Fever.—The number of deaths from this disease was seven hundred and eighty-five (785), or one hundred and sixty-four (164), more than during the previous year.

Hydrophobia.—The following table shows the deaths from this disease since 1860:

1860		1875	2
1861	1	1876	4
1862	4	1877	4
1863	6	1878	2
1864	3	1879	3
1865	2	1880	1
1866	2	1881	5
1867	2	1882	2
1868		1883	3
1869	7	1884	
1870	1	1885	
1871	1	1886	
1872	1	1887	
1873	1	1888	
1874	3		

Inflammation of the Lungs.—The total number of deaths from this cause amounted to one thousand five hundred and eighty-seven (1,587), a decrease from the previous year of one hundred and sixteen (116); there were nine hundred and fifty (950) adults, and six hundred and thirty-seven (637) minors.

Old Age.—The number of deaths so reported amounted to one thousand and fifty (1,050).

Poisoning.—The number of deaths amounted to fifteen (15), a decrease from the previous year of three (3):

Poisoning	2	Laudanum	1
Ammonia	1	Lead	1
Carbolic acid	2	Morphia	1
Chloral	2	Narcotic	1
Concentrated lye	1	Opium	3

Small Pox.—The number of deaths from this cause amounted to eighty (80); this disease prevailed during the months from March to November, inclusive; the number of cases reported was three hundred and sixty six (366).

Suicide.—The number of deaths amounted to ninety-four (94), showing an increase of (6) over the previous year; of these seventy-one (71) were males, and twenty-three (23) were females; the youngest being between the age of ten and fifteen years, classified as follows:

Arsenic	10	Laudanum	4
Carbolic acid	1	Morphia	1
Corrosive sublimate	1	Opium	1
Cutting artery in arm	1	Paris green	1
Cutting artery with axe	1	Poison	1
Cutting throat	8	Prussic acid	1
Drowning	3	Run over on railroad	1
Hanging	36	Shooting	18
Jumping from window	5		

Sun Stroke.—The number of deaths so reported amounted to thirty-seven (37), a decrease from the previous year of ninety (90).

Tumor.—The number of deaths from this cause amounted to ninety (90), an increase over the previous year of fifteen (15):

Tumor	4	Liver	1
Back	2	Lungs	1
Bowels	4	Neck	7
Brain	12	Spine	1
Breast	2	Stomach	2
Chest	1	Uterus	8
Ear	1	Abdominal	22
Face	1	Ovarian	18
Jaw	3		

The following shows the percentage of deaths (to total mortality) during specific periods of life, compared with a similar statement of the mortality in the year 1887:

DEATHS.—*Adults and Children.*

(Still-births not included.)

	1887.				1888.			
Under 1 year.	5,926	Being	24.38	Per cent.	4,977	Being	24.43	Per cent
1 to 2	1,642	"	7.56	"	1,191	"	5.84	"
2 to 5	1,483	"	6.82	"	1,100	"	5.39	"
5 to 10	665	"	3.06	"	562	"	2.75	"
10 to 15	359	"	1.65	"	362	"	1.77	"
15 to 20	602	"	2.77	"	579	"	2.84	"
20 to 30	2,064	"	9.50	"	2,103	"	10.32	"
30 to 40	1,968	"	9.06	"	1,935	"	9.54	"
40 to 50	1,790	"	8.24	"	1,763	"	8.65	"
50 to 60	1,652	"	7.60	"	1,616	"	7.93	"
60 to 70	1,784	"	8.21	"	1,789	"	8.78	"
70 to 80	1,532	"	7.05	"	1,512	"	7.42	"
80 to 90	754	"	3.47	"	750	"	3.62	"
90 to 100	117	"	.54	"	121	"	.59	"
100 to 110	11	"	.05	"	12	"	.06	"

The number of children under ten years of age amounted to seven thousand eight hundred and thirty (7,830), or 38.41 per cent. of total mortality.

DEATHS.—*Adults and Children.*
(Premature births and still-born excluded.)

1888. MONTHS.	Males.	Females.	Adults.	Children.	Total.
January	1,073	1,051	1,344	780	2,124
February	870	794	1,077	587	1,664
March	837	815	1,053	599	1,652
April	834	768	1,022	580	1,602
May	1,024	945	1,190	779	1,969
June	866	732	822	776	1,598
July	927	860	765	1,022	1,787
August	1,188	1,036	998	1,226	2,224
September	725	656	739	642	1,381
October	859	814	1,001	672	1,673
November	693	642	789	546	1,335
December	670	693	801	562	1,363
	10,566	9,806	11,601	8,771	20,372

Excess of males over females 760
Excess of adults over children 2,830

The largest mortality occurred in the month of August—two thousand two hundred and twenty-four (2 224), and the lowest in the month of November—one thousand three hundred and thirty-five (1,335). The excess of males over females was seven hundred and sixty (760), of adults over children two thousand eight hundred and thirty-one (2,831).

Births, Marriages and Deaths for each month in the year 1888.

1888. MONTHS.	Births.	Marriages.	Deaths.
January	2,337	533	2,124
February	2,152	555	1,664
March	2,157	310	1,652
April	1,762	803	1,602
May	1,876	524	1,969
June	2,162	652	1,596
July	2,349	412	1,787
August	2,356	382	2,224
September	2,336	626	1,381
October	2,326	747	1,673
November	2,232	677	1,335
December	2,251	476	1,363
Total	26,296	6,700	*20,372

* Premature and Still Births excluded.

Marriages per each 1,000 population, ... 13.17
Birth, " " " 25.86
Deaths, " " " 20.04

The following table will show the number of small pox cases and deaths in each week during the year 1888,

1887. Weeks ending	No. of cases.	Deaths.	1888. Weeks ending.	No. of cases.	Deaths.
January 7			July 7	27	3
" 14			" 14	17	7
" 21			" 21	21	3
" 28			" 28	14	3
February 4			August 4	10	5
" 11			" 11	8	2
" 18			" 18	8	2
" 25			" 25	3	1
March 3			September 1	2	
" 10			" 8	2	1
" 17	1	1	" 15	2	
" 24	3		" 22	4	
" 31	2	1	" 29		
April 7	2		October 6		
" 14	35	1	" 13		
" 21	23	3	" 20	1	
" 28	12	8	" 27		
May 5	23	7	November 3		
" 12	34	4	" 10	1	
" 19	14	6	" 17		
" 26	17	3	" 24		
June 2	9	3	December 1		
" 9	21	3	" 8		
" 16	16	3	" 15		
" 23	18	8	" 22		
" 30	16	2	" 29		

The population (as per U. S. Census) at each decade was as follows, with percentage of deaths to each 1,000 of population:

YEARS.	Population.	Deaths.	Deaths in 1,000.
1800.*			
1810.	110,210	1,897	†17.21
1820.	137,097	3,189	23.26
1830.	188,797	3,948	20.90
1840.	258,037	4,593	17.78
1850.	408,762	8,034	19.63
1860.	565,529	10,849	19.18
1870.	674,022	15,317	22.72
1880.	846,980	17,711	20.91

* No record of deaths published.
† Still-born and bodies brought from country excluded.

Recapitulation for the past twenty-eight years and six months.

YEARS.	Births.	Marriages.	Deaths.
1860 (six months)	8,434	2,310	6,342
1861	17,271	4,417	14,468
1862	14,741	4,652	15,097
1863	15,296	5,474	15,788
1864	15,591	6,752	17,562
1865	15,428	6,864	17,169
1866	17,437	7,087	16,803
1867	17,007	6,084	13,993
1868	17,259	6,371	14,693
1869	16,960	6,382	14,786
1870	17,194	6,421	16,750
1871	18,346	6,806	16,993
1872	20,072	6,496	20,544
1873	18,702	7,891	16,736
1874	19,387	6,639	16,315
1875	17,933	6,144	18,909
1876	18,695	5,341	18,892
1877	18,279	6,14	16,004
1878	18,346	6,247	15,743
1879	18,449	5,224	15,473
1880	19,338	6,476	17,711
1881	18,154	7,563	19,515
1882	20,098	8,521	20,059
1883	21,237	8,231	20,076
1884	22,160	8,637	19,999
1885	22,656	7,676	21,392
1886	23,221	6,215	20,005
1887	24,113	6,855	21,719
1888	26,296	6,700	20,372
Total	538,147	186,139	499,898

IV.—SPECIAL ORDINANCE OF THE BOROUGH OF ST. PETERSBURG.

A BOROUGH COUNCIL FAITHFUL TO ITS TRUST—AN EXAMPLE WORTHY OF IMITATION.

In contrast to the many instances which come under the notice of the State Board of Health of entire disregard on the part of borough authorities of the important responsibilities devolving upon them by law as guardians of the lives and health of their citizens, it is refreshing to be able to note the prompt and vigorous action of the burgess and town council of St. Petersburg, Clarion county, in this state. Diphtheria having obtained a foothold in the town, and several fatal cases having occurred, the council adopted the following ordinance, and also applied to the State Board for a sufficient number of precautionary circulars against diphtheria to enable them to place one in each family. Such courageous and intelligent action cannot be too highly commended.

BENJAMIN LEE, M. D.,
Secretary State Board of Health.

ORDINANCE.

Be it enacted and ordained, by the burgess and town council of the borough of St. Petersburgh, and it is hereby enacted and ordained by the authority of the same, that it shall be unlawful and strictly forbidden to hold any public school, church, sabbath school, singing school or any public gathering whatever in any public hall, or upon the streets of the borough, during the prevailing disease,

Diphtheria.

until the resident physician of the borough pronounces it perfectly safe to repeal this ordinance. And it shall be the duty of the high constable to see that this ordinance is strictly enforced, and to place a

Diphtheria Notice.

upon any residence where that disease prevails, and any person or persons violating this ordinance, or molesting or destroying any diphtheria notices posted up by the high constable, shall be subject to a fine of not less than $5.00, or more than $10.00, said fine to be collected in a like manner as all other fines for violating borough ordinances.

And it is hereby requested by the council that all parents keep their children at home as much as possible, and forbid their visiting any

house or congregating with any members of any family where diphtheria prevails.

And it is further requested that the citizens thoroughly disinfect their water closets or outbuildings, and remove all rubbish from their yards and alleys, and keep the same in clean condition.

By order of the council,

Attest: JOHN MORGAN,

CHAS. O. DUVE, *Clerk.* *Burgess.*

Dated at St. Petersburg, this 1st day of March, A. D. 1889.

V.—EXTRACTS FROM THE REPORT OF THE BOARD OF HEALTH OF READING.

By M. A. RHOADS, M. D., *President.*

MARRIAGES.

Six hundred and eighty-six marriages were solemnized during the year 1889, an increase of sixty-four as compared with last year.

Three hundred and seven of the ceremonies were performed by the Lutheran clergy; two hundred and eleven by the Reformed; sixty-eight by the Catholic; twenty-four by the Evangelical Association; thirteen by the R. E. Friendship; thirteen by the Methodist; ten by the Episcopal; nine by the U. B. in Christ; six by the Universalist; five by the Baptist; five by the Presbyterian, and fourteen by the aldermen of this city.

Fifty-three of the marriages took place in January; forty-six in February; fifty-nine in March; forty-seven in April; fifty-two in May; sixty-eight in June; twenty-nine in July; fifty-five in August; forty-five in September; seventy-eight in October; seventy-seven in November, and seventy-six in December.

The ages of the contracting parties were:

Under 20—	33 men and	184 women.
20 to 25—	365 men and	355 women.
25 to 30—	165 men and	91 women.
30 to 40—	83 men and	42 women.
40 to 50—	26 men and	7 women.
50 to 60—	12 men and	6 women.
60 to 70—	1 man and	1 woman.
Age not given—	1 man and	1 woman.

Nationality of Grooms and Brides.

	Quarter ending March 31, 1889.		Quarter ending June 30, 1889.		Quarter ending September 30, 1889.		Quarter ending December 31, 1889.		Total.	
	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.
City,	38	55	40	60	40	44	67	93	185	252
County,	64	71	69	69	61	55	97	79	294	274
State,	33	20	33	25	12	18	37	28	115	91
United States,	4	1	9	4	3	2	13	7	29	14
Foreign,	15	9	14	8	13	10	18	17	60	44
Not given,	1	2	2	1	. . .	. . .	. . .	8	3	11
Total,	158	158	167	167	129	129	232	232	686	886

Table Showing the Ages of the Parties at the time of Marriage.

Ages of Grooms.	Ages of Brides.								
	Under 20 years.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	Not given.	Total.
Under 20 years,	28	7	. . .	. . .	. . .	. . .	. . .	. . .	35
20 to 25 years,	126	224	14	. . .	. . .	. . .	. . .	. . .	364
25 to 30 years,	23	94	40	7	. . .	. . .	. . .	. . .	164
30 to 40 years,	6	25	28	23	. . .	1	. . .	. . .	83
40 to 50 years,	1	5	8	9	3	. . .	. . .	. . .	26
50 to 60 years,	. . .	. . .	1	1	4	4	1	. . .	12
60 to 70 years,	. . .	. . .	. . .	1	. . .	. . .	. . .	. . .	1
Not given,	. . .	. . .	. . .	1	. . .	. . .	. . .	. . .	1
Total women,	184	355	91	42	7	5	1	. . .	686

BIRTHS.

Fifteen hundred and eighty-six births were reported during the year, a decrease of 42 as compared with the year 1888. Eight hundred and fourteen were males and 772 were females. Eight were colored—6 males and 2 females. Twins of the same sex, 11; those of opposite sexes, 1.

During the month of January there were 159 births; February, 138; March, 173; April, 114; May, 114; June, 135; July, 137; August, 120; September, 136; October, 113; November, 129, and December, 118.

The excess of births over deaths in the city was 695.

The birth rate was 26.5 in 1,000 for the year 1889, and the death rate 14.9.

Table Showing the Number and Color of Male and Female Births in each Month.

1889.	WHITE.		BLACK.		Total, 1889.	1889.	Twins during 1889.
	Male.	Female.	Male.	Female.			
January,	82	77				159	3
February,	73	64		1		138	
March,	81	91	1			173	2
Total first quarter,					470		
April,	53	59	2			114	
May,	68	46				114	
June,	69	66				135	2
Total second quarter,					363		
July,	72	65				137	2
August,	61	58	1			120	1
September,	68	68				136	1
Total third quarter,					393		
October,	59	53	1			113	
November,	55	74				129	1
December,	67	49	1	1		118	
Total fourth quarter,					360		
Total,	808	770	6	2	1,586		12

Estimated population of Reading January 1, 1890, 59,655.

DEATHS.

Permits were issued by the department for the burial of 1,098 bodies during the year 1889. Of this number 99 were brought here from other places, 74 were still-born, and 34 were premature births, leaving a net total for the city of 891 deaths.

Two hundred and seventy-four were married, 486 single, 130 widowed, and one in which the social condition was unknown.

Four hundred and forty-eight were males, 442 were females, and in 1 the sex was not mentioned. Of the 74 still-born children 41, were males and 33 females, and of the premature births, 14 were reported as males and 20 as females.

Of the decedents, 811 were born in the United States, 73 were of foreign birth, and of 7 the nativity was unknown.

Two hundred and thirty-four died under the age of one year, 39 prior to the second year, 45 before reaching the fifth year, 24 between five and ten, 146 between ten and thirty, 185 between thirty and sixty, 175 between sixty and eighty, 35 between eighty and ninety, and five between ninety and one hundred. In 3 the ages are not given.

One hundred and eighty-nine belong to the class zymotic, 144 to the constitutional, 421 to the local, 77 to the developmental, 52 were the result of violence, and in 8 the cause of death was not given.

Adding together the number of deaths under ten years, we have 342, or 38.38 per cent. of all deaths.

The average number of deaths per month was 74.25, an increase of 5.67 as compared with the year 1888. The least number of deaths in any one month was 54, in October. The greatest number 119, in July.

The average number of deaths per week was 17.13. The greatest number reported during any one week was for the week ending August 5, when there were 44 deaths, and the least number in any one week was for the weeks ending December 9 and March 25, when there were 8 deaths.

One hundred and eight permits were issued for the burial of premature births and still-born children. These are omitted from the general summary as not properly belonging to the death rate. Prior to the year 1887 abortions, premature births and still-born children were counted into the mortality record, and made our death rate appear greater than it really was.

The estimated population for 1889 is 59,665; the annual ratio of deaths per 1,000 inhabitants is 14.9.

The following statement, in tabular form, shows the population and death rate for a period of five years, premature births and still-born children not included in the year 1887, 1888 and 1889:

YEAR.	Estimated population.	Total number of deaths.	Death rate.
1885,	50,500	1,025	20.2
1886,	52,250	861	16.4
1887,	55,500	1,002	18.2
1888,	57,750	823	14.2
1889,	59,655	891	14.9

The nationality of the decedents was as follows:

United States,	1,000	Hungary,	2
Germany,	47	Bohemia,	1
Ireland,	19	Scotland,	2
Unknown,	9	England,	2
France,	4	Prussia,	1
Wales,	3	Poland,	2
Europe,	2	Not given,	4

Monthly Mortality in the City from 1880 to 1889, inclusive:

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.
January,	58	75	93	75	71	90	58	67	81	106
February,	72	69	69	78	66	93	72	61	92	66
March,	79	63	78	85	62	86	69	108	88	68
April,	48	66	79	73	53	77	73	123	64	76
May,	68	63	76	76	67	90	77	76	84	61
June,	80	64	68	70	61	83	56	62	76	54
July,	93	82	75	105	79	110	70	121	88	120
August,	64	102	82	79	86	106	98	99	95	85
September,	57	81	81	53	89	77	70	77	71	76
October,	62	83	86	61	91	75	70	67	67	56
November,	73	73	47	59	90	61	67	75	72	59
December,	66	74	56	55	102	77	81	66	63	64

For the years 1887, 1888 and 1889 the premature births and still-born children are excluded from the monthly mortality table.

Table Showing the Ages of Decedents for 1889. Premature Births and Still-Born Children not included:

	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Not given.	
Deaths,	242	41	48	25	22	40	101	70	67	82	98	99	42	5	8	.
Brought from a distance,	8	2	3	1	3	4	10	9	9	16	9	13	7	. .	5	. .
Net deaths in the city,	234	39	45	24	19	36	91	61	58	66	89	86	35	5	3	891

A recapitulation of the marriages, births and deaths for each month will be found in the following table:

Recapitulation.

MONTHS.	Marriages.	Births.	Deaths.	Total registration.
January,	53	159	125	337
February,	46	138	85	269
March,	59	178	87	317
April,	47	114	89	250
May,	52	114	76	242
June,	68	135	78	281
July,	29	137	141	307
August,	55	120	99	274
September,	45	136	89	270
October,	78	113	78	269
November,	74	129	75	278
December,	80	118	76	274
	686	1,586	1,098	3,370

PULMONARY CONSUMPTION.

Again this disease heads the list with one hundred and eight deaths. The disease was most prevalent in January, February and December. The total deaths for the first quarter were thirty-six; second quarter, twenty-three; third quarter, nineteen; last quarter, thirty. Fifty-five were males and fifty-three were females. Four died before reaching their fifteenth year; forty-four between fifteen and thirty; thirty-three between thirty and fifty; twenty-three between fifty and seventy, and four between seventy and ninety.

INFANTILE DIARRHŒA

Under the above heading are included all cases under two years of age whose deaths have been certified as having occurred from "summer

complaint," "cholera infantum," "diarrhœa," "dysentery," "entero-colitis," etc. Seventy-five deaths are attributed to the diseases mentioned.

PNEUMONIA.

Thirty-eight males and thirty-five females died from pneumonia. Of this number twenty-seven were adults and forty-six minors.

CROUP.

Membranous croup carried off twenty-two children. This does not include diphtheritic croup.

DIPHTHERIA..

Fourteen deaths are reported as diphtheria and diphtheritic croup.
Thirteen died from scarlet fever.
Twenty-six died from typhoid fever.
Forty-one died from apoplexy.
Fifty-four died from "heart disease."
Thirty-seven died from marasmus.
Twenty-six died from various forms of cancer.

A General Summary.

		Percentage of total mortality.
Zymotic diseases,	189	21.2
Constitutional diseases,	144	16.1
Local diseases,	421	47.1
Developmental diseases,	77	8.6
Deaths from violence,	52	5.8

Notwithstanding the increase in population in the past year, there has been a marked decrease in zymotic diseases. The percentage of zymotic or "ferment breeding" diseases is a fair indication of the sanitary condition of a city.

It is gratifying to note the wonderful progress that sanitary science has made in the last ten years. Everywhere the medical profession has been diligent in pushing the inquiry into the causes of disease, and to find out the means by which those causes could be reached and removed. Among all classes of society, is noticed a growing interest in the means of guarding against sickness and disease. People are becoming wiser and more enlightened. They are beginning to have a clearer insight into the causes of things. Intelligent people no longer attribute the consequences of their own neglect and carelessness to the "dispensations of Providence," but they begin to understand how a large proportion of the diseases which afflict humanity result from preventable causes and that it is possible by proper and judicious measures to reduce the death rate and increase the average duration of human life.

Sanitary reform is not bounded nor limited by selfishness. It is broadly humanitarian. The rich man no longer feels that he has no interest in his poorer, neighbor, where wretchedness and squalid poverty prevail, because he knows that disease is no respector of persons, and that a malignant fever in some remote and neglected corner of the city, may send out messengers of death, to poison the atmosphere and penetrate the costly dwellings built on broad avenues and well kept streets. The apparent self-interest of men and women studying and applying the laws of health is, therefore, exactly the reverse of selfishness, since every movement for sanitary reform means clean houses and healthy surroundings for the poor and ignorant.

We see daily around and about us the great amount of work that remains to be done to emancipate the people from the necessity of living under conditions prejudicial to health. The task seems almost a hopeless one. And yet when we consider the past, it is to contemplate the present with evident satisfaction, as we note the steady and sustained progress of improvement and comfort in the homes of the upper and middle classes, while we also see the representatives of these classes devoting their time in bettering the condition of those below them in the social scale. Progress in civilization has given us hospitals and asylums, provided food and clothing and shelter for the indigent and it has organized and carried out measures for the relief of suffering in innumerable ways. Society recognizes its duty and honestly seeks to perform it. Public sanitary work is one of the fruits of practical christianity in highly civilized communities and the sanitarian who seeks to extend the knowledge and promote the intelligent study of nature's laws renders important service in the cause of human progress.

All of which is respectfully submitted,

M. A. RHOADS, M. D.,
President.

VI.—REPORT OF THE BOARD OF HEALTH OF SCRANTON.

By SAMUEL W. EDGAR, *Secretary.*

NUMBER OF DEATHS.

Deaths in the city,	1,415	Still born,	44
Brought to the city for interment,	59		
		Total,	1,518

SEX AND COLOR.

Male, white,	809	Sex not stated,	91
Female, white,	614		
Male, colored,	2	Total,	1,518
Female, colored,	2		

NATIVITIES.

United States,	811	Italy,	6
Ireland,	226	Hebrew,	4
England,	46	Switzerland,	1
Scotland,	5	Holland,	1
Wales,	157	Swede,	1
Germany,	141	Not stated,	81
Hungary,	22		
Russia and Poland,	16	Total,	1,518

AGES.

Under one year,	365	Over 60 years,	177
1 to 5 years,	309	Not stated,	50
5 to 10 years,	83	Still born,	43
10 to 20 years,	73		
20 to 40 years,	225	Total,	1,518
40 to 60 years,	202		

CAUSES OF DEATH.

Asthma,	4	Croup,	60
Apoplexy,	23	Crushed leg,	5
Asphyxia,	2	Cyanosis,	2
Asthenia,	10	Colic,	5
Albuminuria,	2	Catarrahal inflammation,	3
Abscess lumbar,	3	Consumption,	80
Abscess,	2	Dysentery,	58
Accidents,	8	Diphtheria,	70
mine,	21	Debility,	21
railroad,	17	Dropsy,	17
burning,	7	Diarrhœa,	31
drowning,	5	Diabetes,	4
scald,	1	Decay,	2
mill,	2	Epilepsy,	1
shooting,	4	Eclampsia,	5
Ascites,	1	Enteritis,	8
Brain, abscess of,	3	Erysipelas,	4
disease,	3	Endocarditis,	8
congestion of,	15	Emphysema,	1
inflammation of,	10	Exhaustion,	17
softening of,	1	Entero colitis,	5
concussion of,	4	Fever, typhoid,	20
Bowels, inflammation of,	19	scarlet,	55
obstruction of,	2	malarial,	1
congestion of,	3	puerperal,	5
Bladder, inflammation of,	3	intermittent,	1
Bronchitis,	50	spinal,	1
Bright's disease,	22	Fracture of skull,	6
Blood poisoning,	3	thigh,	1
Broken back,	1	dorsal vertebræ,	1
Cancer,	11	Gastritis,	14
stomach,	2	Gangrene,	3
Cholera morbus,	4	Heart disease,	50
infantum,	79	Hip disease,	1
Convulsions,	101	Hemorrhage,	10

Hemorrhage, cerebral,	3	Puerperal,	1
Hepatitis,	2	Pericarditis,	3
Hydrocephalus,	2	Pelvic abscess,	1
Inanition,	9	Poisoning,	4
Internal injuries,	2	Premature births,	22
Jaundice,	4	Pneumonitis,	2
Kidney disease,	5	Pyaemia,	3
Liver disease,	8	Rupture,	1
Lungs, inflammation of,	11	of bladder,	3
congestion of,	7	Rheumatism,	5
Laryngitis,	3	Septicaemia,	11
Meningitis, tubucular,	1	Syphilis,	1
Meningitis,	53	Spina bifida,	1
Measles,	2	Stomach diseases,	2
Marasmus,	30	Sun stroke,	1
Mal-assimulation,	2	Suicide,	3
Mumps,	2	Spinal diseases,	2
Natural causes,	1	Still born,	46
Not stated,	11	Stab wound,	1
Nervous disease,	3	Syncope,	1
Nephritis,	1	Typhlitis,	1
Old age,	11	Tumor,	1
Pneumonia,	127	Unknown,	5
typhoid,	20	Uraemia,	3
Paralysis,	19	Whooping cough,	6
Pleurisy,	6		
Pertonitis,	11	Total,	1,518
Pemphigus,	1		

Marriages, 200

BIRTHS.

White, males,	762	Sex not stated,	10
White, females,	592		
Colored, males,	4	Total,	1,368

CONTAGIOUS DISEASES REPORTED.

Scarlet fever,	206	Measles,	41
Diphtheria,	125	Small pox,	1
Whooping cough,	13		
Typhoid fever,	110	Total,	499
Chicken pox,	3		

Death rate per 1,000, 16.866.

Death rate per 1,000, excluding deaths by accidents and still born, 15.011.

1889, population (estimated) 90,000.

Respectfully submitted.

SAMUEL W. EDGAR,
Secretary.

VII.—REPORT OF THE BOARD OF HEALTH OF TITUSVILLE, 1889.

By THOS. L. HOBART, *Secretary.*

To the State Board of Health:

GENTLEMEN:—I present in tabulated form for your consideration, the eleventh annual report of the board of health, for the year ending December 31, 1889.

The number of births were 144—78 males, 66 females; last year 148—80 males, 68 females, two males and two females less than last year.

Of contagious diseases, fifty-one cases in all, two were from diphtheria, both males; two from typhoid fever, both males; forty-seven from scarlet fever, twenty-three males, twenty-four females.

Up to the first of November only thirteen cases of contagious diseases had been reported, since that time in November and December scarlet fever has become epidemic and thirty-seven cases have been reported. Only four deaths have occurred, two males and one female from scarlet fever and one female from typhoid fever. Of 2,195 cases of contagious diseases in ten years only seventy-five deaths have taken place.

This year there were fifty-two marriages, last year forty-one, an increase over that of last year of eleven, resulting probably from the modification of the marriage law.

Of deaths, seventy-two in all, thirty-seven males and thirty-five females. Last year ninety-three, forty-five males and forty-eight females, a decrease of twenty-one, an average of 7.22 in each 1,000 inhabitants, not half the standard death rate adopted, which is 17.0 in each 1,000 inhabitants. The largest number from any disease is consumption, seven—three males and four females, not one of these were natives of Pennsylvania, one was born in England, one in Ireland, three in New York State, one in Sweden and one in Norway.

The comparison of births is one-half or a hundred per cent. in excess of deaths. Births 144, deaths 72.

All of which is respectfully submitted,

THOS. L. HOBART,
Secretary.

Births in the City of Titusville.

NATIVITY OF PARENTS.

United States,	166	Foreign,	122

Births to each 1,000 inhabitants in 1889 . . . . . 14.44

Births, 1882,	205	Births, 1887,	169
Births, 1883,	172	Births, 1888,	148
Births, 1884,	166	Births, 1889,	144
Births, 1885,	171		
Births, 1886,	149	Total,	1,324

Average births eight years, ... 165 1-2.

Number of Children of Mother.

First child,	35	Ninth child,	2
Second child,	30	Tenth child,	2
Third child,	15	Eleventh child.	
Fourth child,	17	Twelfth child,	2
Fifth child,	13	Thirteenth child,	1
Sixth child,	10	Fourteenth child,	1
Seventh child,	9		
Eighth child,	7	Total,	144

Marriages in the City of Titusville.

NATIVITY OF GROOMS.		NATIVITY OF BRIDES.	
United States,	40	United States,	43
Foreign,	12	Foreign,	9
Total,	52	Total,	52
Number of first marriage grooms,	47	Number of first marriage brides,	50
Number of second marriage grooms,	5	Number of second marriage brides,	2
Total,	52	Total,	52

Contagious Diseases.

DISEASE.	Males.	Females.	1 year and under.	2 yrs and under.	3 yrs and under.	4 yrs and under.	5 yrs and under.	6 yrs and under.	7 yrs and under.	8 yrs and under.	9 yrs and under.	10 yrs and under.	10 to 15.	15 to 20.	20 to 25.	Total.
Diphtheria,	2	..	..	..	..	..	..	..	..	..	1	..	1	..	..	2
Scarlet fever,	23	24	..	2	12	7	6	5	3	3	1	1	5	2	..	47
Typhoid fever,	2	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2
Total,	27	24	..	2	12	7	6	5	3	3	2	1	6	3	1	51

DISEASE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	First ward.	Second ward.	Third ward.	Fourth ward.	Total.
Diphtheria,	..	..	..	..	..	..	..	..	2	..	..	..	..	..	1	1	2
Scarlet fever,	2	1	1	..	..	..	..	1	2	3	24	13	8	29	5	5	47
Typhoid fever,	..	..	..	..	..	..	..	..	..	1	..	1	..	..	2	..	2
Total,	2	1	1	..	..	..	..	1	4	4	24	14	8	29	8	6	51

Number of Contagious Diseases in Ten Years.

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	Total.
Diphtheria,	28	15	45	17	19	9	44	16	17	2	212
Measles,	...	1,331	3	...	...	1	1	8	300	...	1,644
Scarlet fever,	5	11	19	35	22	58	47	20	28	47	292
Typhoid fever,	13	12	2	5	2	1	2	1	3	2	43
Small-pox,	...	...	4	...	...	...	...	...	...	...	4
Total,	46	1,369	73	57	43	69	94	45	348	51	2,195

Number of Deaths from Contagious Diseases in Ten Years.

	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	Total.
Diphtheria,	2	3	12	1	3	...	7	1	2	...	31
Measles,	...	2	...	...	...	...	...	...	7	...	9
Scarlet fever,	...	1	2	1	3	3	1	1	2	3	17
Typhoid fever,	5	3	...	1	2	1	...	1	2	1	16
Small-pox,	...	...	2	...	...	...	...	...	...	...	2
Total,	7	9	16	3	8	4	8	3	13	4	75

Total number of contagious diseases in ten years, ... 2,195
Total number of deaths from contagious diseases in ten years, ... 75

CAUSE OF DEATH.	Total.	Male.	Females.
Abscess,	1	1	. . . . .
Accident, boiler explosion,	1	1	. . . . .
Accident, burned,	2	2	. . . . .
Anæmia,	1	1	. . . . .
Bright's disease,	3	3	. . . . .
Convulsion,	1	1	. . . . .
Cancer,	3	1	2
Catarrh, laryngitis,	1	. . . .	1
Child birth,	1	. . . .	1
Cholera infantum,	6	2	4
Complicated diseases,	1	. . .	1
Congestion lungs,	1	1	. . . .
Consumption,	7	3	4
Cramps,	1	. . .	1
Diabetes,	2	1	1
Diarrhœa,	2	1	1
Dropsy,	2	1	1
Exhaustion,	2	2	. . . . .
Fever, brain,	2	1	1
Fever, scarlet,	3	2	1
Fever, typhoid,	1	. . . .	1
General debility,	1	. . . .	1
Heart disease,	2	1	1
Inflammation bowels,	2	1	1
Kidney disease,	3	2	1
Obstruction bowels,	1	1	. . . .
Old age,	5	2	3
Paralysis,	2	1	1
Pneumonia,	3	1	2
Rheumatism,	3	1	2
Whooping cough,	1	. . .	1
Unknown,	5	3	2
Total,	72	37	35

Average deaths to each 1,000 inhabitants,	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889
	11.4	10.6	9.94	7.29	7.13	7.94	9.04	7.97	9.33	7.22

United States,	47
Foreign,	25
Total,	72

APPENDIX D.

REPORTS OF CONFERENCES AND CONVENTIONS.

I. Report of the Delegates to the Meeting of the American Public Health Association.
II. Sanitary Convention at Pittsburgh.

I.—REPORT OF THE DELEGATES TO THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

By JOS. F. EDWARDS, M. D. and BENJAMIN LEE, M. D.

The seventeenth annual meeting of this representative body of men and women interested in the subject of hygiene, was held in Brooklyn, N. Y., October 22d, 23d, 24th and 25th.

THE OVERSHADOWING OF OUR HOMES

was a most important topic, which was discussed, in the absence of the author of the paper, (Dr. W. Thornton Parker) by Professor Charles A. Lindsley of Yale College.

The truth was well stated when the author said that a soil loaded with roots and shaded from the sun is unfit to live upon. Free drainage, abundant sunlight and pure air in free circulation must be obtained by thinning out shade trees. We must note that the author says, *thinning* out,for, in the discussion which followed the reading of the paper, there were some who held that shade was not injurious to health; neither is it any more than good roast beef *in moderation* but *overshadowing* is as bad as *gluttony*; if our shade trees are thick enough to deny the sunshine access to our houses, then we had better thin them out or we will have rheumatism, *malaria*, and pneumonia as the results. A happy intermingling of shade and sunshine is what we want, not too much of either.

CLOTHING IN ITS RELATION TO HYGIENE.

Dr. James F. Hibberd, of Richmond, Ind., whose years of practical experience are worth centuries of theories, tells us that we do not dress properly, so that the functions of the skin may be normally carried on. Many dress too warmly and it would be much better were the cloth-

ing so arranged as to allow free circulation of air and proper ventilation of the exhalations of the skin without too great loss of heat in cold weather.

We have, ourselves, often thought that the heavy and cumbersome clothing worn by so many in winter must be unhealthy. We must remember that animal heat is developed within the body and the use of extra wraps in cold weather is that this heat may be retained for the comfort of our bodies and not be immediately dissipated into the atmosphere. But, would it not be wiser to increase the amount of heat generated, which we can do by the use of fatty and saccharine articles of food combined with exercise, so that we will be comfortably warm in cold weather, without the exhausting burden of heavy coats and wraps. One knows what a sensation of warmth is produced by a brisk walk on a cold day; this is because the exercise has caused the generation of an extra amount of heat within the body. To repeat therefore, a combination of diet and exercise may be wisely substituted for the heavy and burdensome wraps and coats.

CAUSES AND PREVENTION OF INFANT MORTALITY.

Dr. Jerome Walker, of Brooklyn, deplored the fact that, as he claims the common belief that infant mortality in this country has diminished of late years is not sustained by statistics. In this, as in several other matters, there seemed to be, judging from the various remarks that were made, a wide difference between the experience of the observers of Brooklyn and New York City, not to be explained by any difference in the geographical relations of these cities, for apropos of this special subject of infant-mortality, Dr. Stephen Smith, of New York, who has had ample opportunities for observation tells us that there has been a diminution in this death-rate, in New York City; which in the year 1869 was as fifty-three of the whole death rate, while in 1888 it had fallen to forty-two. It was stated that in Cleveland, Ohio, the infantile mortality among the Irish is comparatively low, while it is very high among the Bohemians, Poles and kindred races, whose infants sleep on little hair pillows and usually have similar appliances fastened about their bodies. The immunity of the Irish babies is attributed to the fact that they are nearly always out of doors, where they have plenty of air. Both Drs. Smith and Dr. James of New York, made, what seemed at first sight the startling statement that infant mortality is less in the tenement houses of New York than among the better classes in that city. This seemingly paradoxical statement was comprehensible when attention was called to the fact that tenement-house babies are nearly always in the open air, while, at the same time they are not pampered, fed and confined to overheated rooms as are the offspring of the wealthy. The lever that is to raise the death-stone of ignorance from the lives of our little ones, according to the opinion of all who

spoke on this most important subject, is *popular education* on the care of infants. Dr. R. O. Beard of Minneapolis, Minn., who presented a most valuable paper on this subject, very truly said that the errors now common in the treatment of a baby in its cradle would suffice to kill a man. The dirty nursing bottle and tube, the mixed food left standing near the kitchen sink to absorb foul sewer gases, the foul close atmosphere of baby's apartment, the almost universal inattention to the thirst of the child (a baby requiring water the same as an adult) the heavy, wearisome, life-destroying clothing with which the pride of the mother must deck her darling whenever it goes out of doors, all combine to make us feel that the reasoning of evolutionists who talk about the "survival of the fittest" is all bosh in connection with infant mortality and that we should rather speak of "those who are strong eonugh to live in spite of human ignorance or human carelessness."

The remedy, as we have said, is to be found, when those who have voluntarily assumed the responsibility of bringing into the world and raising children will come to consider it a sacred duty to inform themselves how to properly meet this responsibility. There is an abundance of literature on the subject.

FEEDING COWS ON BREWERY WASTE.

Dr. Walker told us the results of some experiments wherein it was demonstrated that while cows fed on brewer's slops, gave an increased supply of milk, yet such milk putrefied more rapidly and it was concluded that milk given by cows fed on pure hay is the best.

THE DWELLINGS OF THE POOR.

A philanthropic suggestion that would, no doubt, be financially profitable, is made in the address of Mr. Alfred F. White, C. E., of Brooklyn, when he urges the erection of sanitary dwellings for the poorer classes. This has been done in London, and the infant mortality in that city in 1888 was only 15.99 per 1.000, while in New York City it was 26.18 and even in Philadelphia, where our conditions are so much more favorable, it was 20.70 per 1.00.

INFANTILE DIARRHŒA IN THE SOUTH.

Dr. Maxwell, of Florida, called attention to a curious fact, the cause of which was not explained, that infantile diarrhœa is much less common in the South than in the North. Thus while the death rate from this cause in New Orleans was only seven in ten thousand, in Boston it is twenty-five, and in Chicago thirty-five in ten thousand.

LOCAL HEALTH OFFICERS.

Dr. George Homan's (St. Louis) paper on this subject, causes us to again urge, what we must day after day, and year after year, everlast-

ingly and eternally urge that it will be a glorious day for the people when they become alive to the fact that well-paid health officers supported by intelligent, well framed and comprehensive health laws, are as much of a necessity to the common weal as well-paid sheriffs, court clerks, policemen or soldiers. This time is surely coming and the sooner the people become alive to the beneficence of hygiene the sooner will it arrive. It is a grievous error, into which many sanitarians fall, to claim that hygiene is not popular and to bemoan the fact that the people take so little interest in the subject. We are in a position to know whereof we speak and we positively assert that, wherever it is rightly understood, hygiene is to-day, the most popular of all popular subjects. It is only where the word has been heard without an understanding of its meaning and significance that it is *seemingly* a neglected and unappreciated subject.

THE NEWNESS OF HYGIENE.

We must not forget that scientific, rational, intelligent hygiene is a thing of the present generation. This fact was well put in the "annual address" by the President of the Association Professor Hosmer A. Johnson of Chicago, when he said "The measures looking to the prevention of disease by the use of scientific methods are modern. The maxims of Hippocrates, the ceremonial of the Hebrew law as to bathing, and the establishment of quarantines, are almost the only exceptions. For the most part suffering has been regarded as an infliction of the gods, or among Hebrews and Christians as a dispensation of Divine Providence. The accounts we have of the pestilence of Egypt and the plague of Athens in the earlier centuries and the visitations of Florence, London, and other cities in modern times, illustrate this tendency of the human mind in the midst of its sorrow to turn to the supernatural. Sacrifices among the Pagans, fasts and discourses upon the terrible judgments of God among the Israelites and Christians, have been regarded as among the most efficient means for the arrest of the scourge. The profession of medicine in olden times could do but little in the way of educating people in better methods and in leading them to the use of more efficient measures for the maintenance of public health. In fact, we find the most diverse opinions held by the masters of the art of healing, as to the nature of disease itself, its causes and consequently the modes of its prevention.

A few facts in the sanitary, or rather unsanitary, history of London during the seventeenth century are suggestive of what was in all probability taking place over all the civilized world. These facts also give us a satisfactory explanation for the slow growth of the population of that century, as compared with the nineteenth. In 1625, a writer said: "The plague caused the death of 5,000 a week during a part of the summer." In 1665, July 16, he wrote: "There died of the

plague in London this week, 1,100." In the week following 2,00. August 8, the writes in his diary: "Died this week in London 4,000." August 15, the same summer: "There perished this week 4,000." He seems to have left the city for awhile, for on September 7 he says: "Came home; there perished nearly 10,000 poor creatures weekly."

Sydenham, a very reliable medical authority, says of the same summer: "There died in one week, 8000, while two-thirds of the population were out of the city." The population is not certainly known, but probably at the time referred to was not over half a million, as it was only something over 800,000 at the beginning of the present century. Smallpox also ravaged the cities of Europe in winter, while plague decimated them in summer. In 1695 a reliable writer (Pepys) says, casually, in the discussion of other subjects: "The deaths were from smallpox increased to 500 more this week than last."

What should we think in Brooklyn to-day with 500 deaths more this week than last from smallpox, with the probabilities that last week the number had reached into the thousands? But for vaccination, such might be our experience. Smallpox was always present and caused the death of one-sixth of the population of all the larger cities.

The death rate was greater than the birth rate, and the population of London and other cities was maintained by a constant influx from the provincial districts. During all this time the means of communication were few and a priori we should not expect contagious disases to spread with anything like the degree of rapidity made possible in this age of railroads and steamships.

How much the death rate has been reduced in England in the last two hundred years we do not certainly know, but there is reason to believe that in London it has diminished from 40 or more in the 1,000, at the beginning of the present century to about one-half that number. The plague is a grim spectre of the dead past.. Smallpox is a Samson shorn. The increase in population has been correspondingly rapid. I think we may safely infer that the diminution in the death rate and the increase in the population throughout Great Britian has borne some proportion at least to what has been accomplished in the metropolis. This increase of population has taken place notwithstanding the fact that during the last half century, millions have come from the British Isles to our own shores, while yet other millions have found other lands.

Professor Tyndall very justly says in the preface to his essays on "Dust and Disease," and other papers: "On public sympathy the sanitary physician has mainly to rely for support in a country where sanitary matters are left so much in the hands of the public itself as they are in England," and he might have added in the United States. "But," he continues, "sympathy without cause, that is, without some basis of knowledge, is hardly to be expected."

Tyndall and Huxley, with a host of co-workers in every department

of knowledge, have done much to supply this cause of sympathy, this base of knowledge. With the development and growth of one new science in these later times, with a better knowledge of the conditions of life and the modes and means by which it is modified, another new science has been brought into existence.

A death from typhoid fever now means not so much a dispensation of providence as it means foul water, foul food or foul air. A city is decimated by a pestilence, and it is found that its foundations are honey-combed with cess pools, and its drinking water is diluted sewage. The judgments of God, in the light of these revelations, become no more mysterious than the pains of the child that laughingly thrusts its tiny fingers into the brilliant flame only to feel the terrible infliction that follows. There has come to be an enthusiasm in the medical profession on this subject which has made itself felt in various ways. This zeal has communicated itself to the public. It is contagious, if I may use the term. It is well known that some diseases are communicable, but only to those who have what has been called a susceptibility to them. So it is with these notions about health. The public has become susceptible as it never was before.

It is not many years since an effort to instruct the public in the management of their own homes, such as wells, cisterns, cellars, drains, light and clothing, especially any intimations that kitchens, alleys and outhouses, were filthy, would have been regarded as an impertinence. What the physician could not prevent, therefore, he contented himself with an effort to cure. Such suggestions are now gratefully received and are made the basis of action.

This last paragraph is eminently true and was never better demonstrated than in the State of Pennsylvania during the past summer when so many portions of the State were fearful of the pestilential sequences of our terrible floods. Everywhere the health officials were those to whom the people looked, and their suggestions were received with a welcome, and acted upon with an alacrity never in the previous history of the world accorded to any utterances save those of the divinities of the benighted pagans.

HEALTHY EMPLOYES DO THE BEST WORK.

We must take exception to the statement made by Professor Johnson that "the egotism that leads manufacturers and others engaged in the various industrial occupations to ignore, in their eager pursuit of wealth the public welfare, will always be an obstacle to the enactment and execution of health laws," for, our own experience teaches us that manufacturers and corporations employing large numbers of persons are rapidly finding out that healthy persons will do healthy work, and the importance of what might be called

is being actively appreciated by them; in addition to which, as Professor Johnson so truly says, "the general enlightenment on the part of the public which we so confidently look for, will compel obedience to these as well as to other forms of police regulations."

LOCAL HEALTH AUTHORITIES.

We are heartily in accord with Professor Johnson, when he says that "there should be in every town or city or district a health authority. Under the direction of this authority there should be a survey first made with a view to determine the presence or absence of the physical conditions that unfavorably affect health. This study should include not only the natural conditions, such as the climate, soil, exposure to sun and air, neighborhood, including water, wood and elevation, etc., as suggested by Hippocrates many centuries ago, but it should also embrace the condition of the population, their nationality, occupations, dwellings, density and food. It should also show the methods of removal of accumulations, and in the more populous districts the disposal of sewage, the conditions of streets and alleys, and the character of drinking water. There should also be noted any special industries by which air or water may be contaminated. The bearing of most of these different industries upon public health is now well known. In addition to these studies there should be a careful collection and preservation of the statistics of births, deaths, marriages, the prevailing diseases, the causes of death, and the increase or decrease, if such be the case, of population. This is only a suggestion of a few things that should be done, and these should be done in the smaller towns and villages as well as in the larger cities. With a knowledge of these matters, intelligent measures could be taken to reduce to a minimum the evils that grow out of our gregarious necessities. These health organizations of the smaller corporations, such as towns and villages, should be brought together by the county or by the State. By the larger bodies there should be secured uniformity of methods of procedure, such as the registration and classification of statistics. Information should be exchanged in this way as to the sanitary condition of communities. Concerted action should be taken for combatting a common foe. How far this has been realized many of you perhaps know, or, rather, many of you know how far short of this realization we are to day. We have in the most of our large cities as departments of government, health boards or commisioners of health. In some States we have general laws looking to uniform modes of registration and procedure. In a large majority of the States of the Union we have State Boards of Health, all created within the last few years. That more money and care should be given to preserve the lives of our cattle

than of our men, women and children seems strange. The Government carefully looks after the one and carelessly neglects the other.

"As typhoid fever is a greater calamity than Texas fever, as Asiatic cholera is more to be dreaded than hog cholera, so do we need a department of public health more than a Department of Agriculture; a bureau of vital statistics more than a bureau of animal industry."

CONCEALED PLUMBING DEFECTS.

A world of wisdom was covered by the remark of the Hon. Seth Low, ex-Mayor of Brooklyn, who, in the course of an allusion to the Health Exhibition (in connection with this meeting), said that he had heard that the sanitary exhibition now being held under the auspices of the association displayed some excellent samples of the plumbers' work. He feared though that they were simply that portion of work as really seen by the public. What he would like to see exhibited was that which was concealed and brought disease and sorrow to many families.

THE RESULTS OF OUR WORK ON FUTURE GENERATIONS.

In the course of his "Address of Welcome," the Hon. Alfred C. Chapin, Mayor of Brooklyn, called attention to the fact that the health of the present generation will bear fruit in its descendants and succeeding generations will owe us a debt of gratitude for our efforts in securing their health.

THE UNITED STATES CENSUS IN ITS RELATION TO SANITATION.

From Dr. John S. Billings, of the United States Army, we learn that one of the most important questions in the vital and social statistics of this country relates to the fertility, longevity, and liability to certain diseases of those partly of negro and partly of white blood, and the only way to obtain data on this subject is through the registration of vital statistics. For all cities of ten thousand inhabitants and upward, it is proposed to collect as complete information as possible with regard to altitude, climate, water-supply, density of population, sewerage, proportion of sewered and non-sewered areas, and other points bearing on healthfulness of the place which will permit of interesting comparisons with the death-rates. The cordial co-operation of all physicians and sanitarians is solicited in making the data of these reports accurate and complete. It is desired to make these vital statistics an unanswerable argument in favor of systematic public sanitary work and of the granting of State and municipal funds necessary for maintaining such work.

IMPROVEMENTS AT THE NEW YORK QUARANTINE STATION.

Dr. Wm. M. Smith, the Health Officer of the port of New York, who read a paper on this subject, illustrated by stereopticon views, began with the history of the earliest establishment of a quarantine station

in New York, and went on to describe how the present grounds were taken up for that purpose. Illustrations of the ground plans of the buildings were thrown on the screen, and the speaker explained how the drainage and sewerage of the island were constructed; how patients suffering with contagious diseases were enabled to enjoy an outing without coming in contact with any of the other patients. Then the methods of disinfecting were explained, and views of the various chambers used for the purpose were shown.

The Association then adjourned and proceeded to take an excursion to the Quarantine and East River hospitals, accompanied by Dr. Smith.

THE PREVENTION OF CONSUMPTION.

Dr. Ezra M. Hunt, the Secretary of the State Board of Health of New Jersey, Dr. E. Plater of Ottawa, Canada, and Dr. P. H. Kretzchmar, of Brooklyn, read papers on this important subject, and they were well discussed. The important points established were that those who know that they are victims of consumption or who have any reason to suspect that they may have the disease, should avoid promiscuous and indiscriminate expectoration, that is to say, they should expectorate not on the floor, but into a receptacle that may be disinfected; in this way the seeds of the disease may be destroyed instead of being carried, when the expectoration has dried, by the atmosphere, to some individual who will present a suitable soil for their development.

OCCUPATION FOR CONSUMPTIVES.

Those who have the disease or a tendency towards it should never engage in any indoor occupation.

LUNG EXERCISE.

A most important means of prevention, we believe, was referred to by Dr. E. Plater, when he suggested systematic lung exercise. It was noted by Dr. Kretzchmar that a long, flat chest was usually the condition found in those who are victims of consumption, and this shape could and can be altered to a shorter, convex chest, by a system of forced filling and emptying of the lungs; by deep inspirations and prolonged, deep expirations carried on in the open air.

DESTRUCTION RATHER THAN ISOLATION.

It has been suggested by some authorities that those afflicted with consumption should be isolated from their fellows, because of the contagious nature of the disease. This, Dr. Kretzchmar justly and humanely thinks a very unnecessary and inhuman procedure, instead of which he recommends the destruction of the seeds of the disease as already mentioned.

During the discussion which ensued on this subject we were glad to

hear Dr. J. F. Hibberd, of Richmond, Ind., emphatically assert his belief that the best means of protection against germ diseases is to be found in so maintaining the general condition of the body that it will be able to resist the action of the germs even should they find access thereto.

We have on several occasions urged this view. Two conditions are necessary for the production of a germ disease; first, the germ or seed, and, secondly, the existence of a soil congenial for its development. The seeds are so universal, so insidious, so invisible, that it is a difficult matter to avoid them, but if we always thoroughly maintain the standard of bodily health (which each individual has it in his own power to do), then it will matter little comparatively speaking) how prevalent may be the seeds as the condition requisite for their development will be wanting.

THE ART OF SANITARY COOKING.

An important paper on this subject was read by Edward Atkinson, LL.D., of Boston.

THE CAUSE OF YELLOW FEVER.

The essence of Dr. George M. Sternberg's paper on this subject was that he has not yet discovered the cause of yellow fever, and doubts if any other investigation has; but that he believes himself to be in a fair way of doing so.

THE DISPOSAL OF GARBAGE.

One of the most vital questions in large cities, and indeed in every household, to-day, is the harmless disposal of garbage. This subject was discussed by Dr. R. Martin, the Health Commissioner of Milwaukee, Dr. S. S. Kilvington, the Health Commissioner of Minneapolis, and many members of the Association, but, unfortunately, no definite conclusions were reached. A committee, appointed at the last meeting to investigate the subject failed to make an official report; the committee was continued, with instructions to finally, definitely and officially report at the next meeting.

Dr. Kilvington told us some very interesting facts, demonstrating that our older and larger cities may learn many valuable lessons from their smaller and newer brethren of the West. Dr. K. seems to be the right kind of a health officer, for he does not let his evident enthusiasm for hygiene run away with his judgment. There are no costly contracts for garbage removal in Minneapolis: on the contrary, like the waiters at the Grand café, in Paris, he who would remove the garbage of Minneapolis must pay well for the privilege thereof. Each collector pays for his license to do the work and this license must be exhibited on numerous occasions. The route of each collector is known and

watched, and if any garbage drops on the street it is an easy matter to detect the party who is responsible therefor. The refuse of a city has in it most valuable materials, and it is but right that its removal should prove rather a source of revenue than an expense upon the community. New York wastes many thousands of dollars annually by dumping its garbage into the lower bay, to say nothing of the extreme sanitary dangers involved in this barbarous and offensive practice.

FOOD IN ITS RELATION TO HEALTH.

Americans eat more than is required for the maintenance of health, was the pith of the paper read by Prof. W. O. Atwater, of the Department of Agriculture at Washington. The paper was a most exhaustive and admirable scientific dissertation on this important subject.

SULPHUR AS A DISINFECTANT.

If any man ought to have a *practical* acquaintance with the merits of various disinfectants, that man, surely, is Dr. Cyrus Edson, for he holds, and has held for some time, the position of Chief Inspector of the New York City Health Department. Dr. Edson believes in the efficacy of sulphur as a disinfectant, and his statement of this fact gave rise to a useless discussion that consumed much of the valuable time of the Association. A useless discussion, we say, because this subject has been already thoroughly investigated and officially reported upon by a most efficient committee of which Dr. George M. Sternberg was chairman.

The facts seem to be that sulphur may be relied upon to destroy the germs of scarlet fever, measles and small-pox, but not those of diphtheria. Dr. Durgin, the Health Officer of Boston, stated that he had used sulphur as a disinfectant for twenty-two years and he was emphatic in his endorsement of it.

Dr. Sternberg says that sulphur will not destroy the germ of erysipelas. In New York city, the method now pursued by Dr. Edson, consists in burning a mixture of ¼ flowers of sulphur and ¾ stick sulphur for about six hours to disinfect a room after a contagious disease, while the clothing and all removable articles that have been exposed to the poison of the disease are removed to be disinfected by dry heat. The proper way to use sulphur is to place it in a receptacle which shall be placed in a tub of water and the sulphur ignited by means of hot coals or having saturated it with alcohol, it can be fired with a match. The water in the tub will add to the efficacy of the sulphur, but if woolen fabrics about the room happen to be wet, they will be ruined by the fumes of the sulphur; not so if they are dry. We should burn three pounds of sulphur for each 1,000 cubic feet of space in the room to be disinfected. Dr. Edson likes to leave all furniture and hangings just

as they have been during the sickness so that the disinfection may reach them just as the infection has done.

SANITARY ENTOMBMENT.

Rev. Charles R. Treat, of New York city, not only presented a valuable and interesting paper on this subject, but he set an example to all sanitarians and sanitary associations who would interest the public, by the way in which he handled his subject. Naturally, a fluent and pleasing speaker, Mr. Treat called to his aid the stereopticon, the combination making an address which no one who heard it will ever forget.

The speaker while earnest and uncompromising in his condemnation of earth burial, whereby the soil is poisoned, yet was mindful of the sentimental objections to cremation. His plan recommends the erection of handsome, imposing, solemn and suitable buildings, wherein little recesses or spaces are provided for the reception of bodies. Then a current of air is made to pass over the body so that it is dessicated or dried up, as it were, thus artificially bringing about the condition that is naturally produced by the peculiar atmosphere of certain portions of the world. A building 200 by 300 feet could be made to provide accommodation for 30,000 bodies. There is absolutely nothing revolting about Mr. Treat's suggestion. The funeral can take place in the usual way and the body laid to rest in a handsome sepulchre that will prove but pleasant to the feelings of the survivors. No possible pollution of the soil can, in this way, take place. This idea meets all the objections to earth burial and has none of the features that have been urged against cremation.

THE SANITARY NECESSITY FOR THE ANNEXATION OF CUBA.

We all know that yellow fever is continually menacing the southern sections of our country and that this danger is because of our proximity to Cuba, where, owing to frightfully insanitary conditions this disease is, practically, always present: but we are not so familiar with the facts brought out at this meeting by Dr. Benjamin Lee that from this same cause Cuba is the cradle from which small-pox and, (horrible to say) leprosy are being introduced into our country. The conclusions reached in Dr. Lee's paper, may be thus summarized:—

1. The exigencies of traffic and travel, render rapid and constant communication between the United States and Havana a necessity.

2. Havana is one of the most notorious breeding places of yellow fever, and is never free from its presence.

3. The only means by which the germs of this disease can be eradicated, are a proper system of sewerage and drainage, which shall deliver the filth of the city at a distant point into the waters of the ocean, and the removal of all the feculent soil.

4. There is no hope that the Spanish Government will ever undertake a work of this magnitude for a dependency.

5. The introduction of yellow fever into the United States through both legitimate and illegal channels of trade must be of frequent occurrence, so long as this condition of things continues.

6. A single widespread epidemic of yellow fever would cost the United States more in money—to say nothing of the grief and misery which it would entail—than the purchase money of Cuba.

7. The precautions against the spread of small-pox in Cuba are entirely inadequate and are rendered ineffective by reason of the superstition of a large proportion of the inhabitants. Hence epidemics of that loathsome disease are of frequent occurrence.

8. Leprosy prevails in Havana and the Island of Cuba to a serious and constantly increasing extent.

9. Leprosy is absolutely unrestricted in this island. While there is an immense and admirably administered Leper Hospital in Havana, its inmates go and come among the residents of the city and country at will, until locomotion is rendered impossible by mutilation.

10. The ravages of the disease are confined to no class or race.

11. Leprosy has already obtained a foot-hold in the United States in the ports nearest to and in most constant communication with the Island of Cuba.

12. Leprosy has but one history, that of constant progression unless it is checked by isolation of the most absolute and unrelenting character.

13. No centre of leprosy has ever originated in the United States. The importation of the first case of a series can always be distinctly traced.

In view of these dangers, which to us seem very real, Dr. Lee, offered a resolution to the effect that this association should respectfully urge upon the President of the United States the expediency of opening negotiations with the Spanish Government with the view of an amicable transfer of the island of Cuba to the United States. In this way, and in this way alone, does it seem that we might metamorphose this hotbed of disease into a delightful garden spot of health. This resolution was referred to the Executive Committee and received back from them with the report that it was not in the province of this association to make such a recommendation. Dr. Henry B. Baker, the Secretary of the Michigan State Board of Health was elected President of the association for the ensuing year; Dr. Frederick Montizembert, of Quebec, 1st Vice-President; Dr. J. H. Raymond, of Brooklyn, 2d Vice President; Dr. Irving A. Watson, of New Hampshire, Secreatry; and Dr. J. Berrien Lindsley, of Tennessee, Treasurer.

The next meeting will be held in November, 1890, at Charleston, S. C.

II. REPORT OF THE SANITARY CONVENTION HELD AT PITTSBURG, MAY 31st., AND JUNE 1st., 1889.

1. Organization.
2. Prayer.
3. Address of Major W. C. Moreland.
4. Reply of Benjamin Lee, M. D.
5. Cellar Air in Houses, by Rev. E. H. Supplee, Ph. D.
6. Discussion.
7. Soft Drinks, by Prof. Henry Leffmann, M. D.
8. An Instrument to show the Purity of the Air in the Sick Room.
9. Letters of Regret.
10. Rivers as Sources of Water Supply, by Col. T. B. Roberts.
11. The Selection and Treatment of Public Water Supplies, by Prof. Henry Leffmann, M. D.
12. Discussion.
13. The Proper Mode of Conducting Sanitary Inspections, by Prof. William B. Atkinson, M. D.
14. Garbage Cremation.
15. Notification of Contagious Diseases.
16. The Annual Address, by Jackson Piper, M. D.
17. A Plea for Public Health Work in Villages, by Henry B. Baker, M. D.
18. Discussion.
19. Adulteration of Food and Drugs, by Percy F. Smith, Esq.
20. Discussion.
21. Railroad Sanitation, by Joseph F. Edwards, M. D.
22. Bread, by Samuel S. Marvin.
23. Discussion on Railroad Sanitation.
24. The Hygiene of the Teeth, by Dr. J. O. Flower.
25. Discussion.
26. Sanitary History of Pittsburgh, by Crosby Gray, Esq.
27. Discussion.
28. Contagious Diseases among Domestic Animals, by Charles McIntire, M. D.
29. Metal Workers' Occupation and his Health, by Pemberton Dudley, M. D.
30. Some of the Advantages of Modern City Buildings with Special Reference to the Respiratory Organs, by W. T. English, M. D.
31. Bovine Vaccination, by H. M. Alexander, M. D.
32. Dangers to Health in Suburban Districts, by J. H. McClelland, M. D.
33. The King's Evil, by George H. Rohé, M. D.
34. Hygiene of Public Institutions, by Selden H. Talcott.
35. Ventilation and Health, by M. B. Goff, L. L. D.
36. The Small-Pox at Nanticoke, by Lewis H. Taylor, M. D.

The convention was called to order by Dr. J. H. McClelland, who on behalf of the State Board of Health, nominated the following officers who were unanimously elected:

President,

Mr. William Metcalf.

Vice Presidents,

Hon. B. F. Jones,
Hon. John Dalzell,
Hon. Chas. W. Stone,
Judge Acheson,

M. B. Goff, LL. D.,
Hon. M. S. Quay,
Judge Magee,
Judge Stowe,
Robert Pitcairn,
M. K. Moorehead,
James McCrea,
James B. Scott,
E. M. Ferguson,
W. J. Moorhead,
Hon. Jno. C. Newmeyer,
Hon. John Upperman,
Hon. M. C. Watson,
Joseph Albree,
H. E. Collins,
A. H. Childs,
D. W. C. Sidwell,
George S. Griscom,
A. H. King,
William A. Herron.

Secretary,

George L. McCoy, Esq.

Assistant Secretaries.

Mr. J. H. Beal and Mr. W. J. Robinson.

The PRESIDENT. I appreciate fully the honor of being called upon to preside over this convention. It is not necessary for me to detain you with any remarks of my own and therefore we will go on with the business of the convention.

Right Rev. Bishop Whitehead will now open the Convention with prayer.

Right Rev. Bishop WHITEHEAD: Almighty God, Father of Jesus Christ, to whom the whole family of heaven and earth is bound, we commend to Thy continual care the families of Thy people and the homes in which they dwell; put afar from these the pride of life and every bitterness; endue them with faith, temperance, patience and kindliness; knit together in constant affection those who in holy wedlock have been made one flesh; turn the hearts of fathers to the children and the hearts of the children to their fathers; and sow kindly charity among us all that we may ever dwell kindly affectioned with brotherly love. As Thou lovest those who are broken in heart let thy fatherly kindliness be upon all that Thou hast made to suffer.

Forgive us wherein we have failed to care for the sick and the helpless; and stir us up to good works. Give unto all men desire of industry and the pride of honest labor that they may dwell peaceably upon the earth. Lift up those who are cast down: befriend innocent sufferers and sanctify to them the endurance of their wrong, and early deliver them.

Cheer with hope all discouraged and unhappy people, and by Thy grace preserve them from falling. Preserve from falling those whose penury tempteth them to sin.

Prosper with Thy blessing we pray Thee these thy servants here. Give them wisdom and the sympathy and coöperation of those for

whose benefit they labor. Direct them, Oh Lord, in all their doings with Thy most gracious favor. Favor them with Thy continuing love, that, in all their works, begun, continued and ended in Thee, they may glorify Thy holy name, and benefit Thy people, through him by whom alone we have life and salvation, and who hath taught us when we pray to say, "Our Father who art in heaven, hallowed be Thy name, Thy kingdom come, Thy will be done on earth as it is in heaven; give us this day our daily bread and forgive us our debts as we forgive our debtors, and lead us not into temptation but deliver us from evil, for thine is the kingdom, and power and glory, forever, Amen.

The PRESIDENT. I now have the pleasure of introducing to you Major W. C. Moreland, who will address the Convention on behalf of the City of Pittsburgh.

3.—Major W. C. MORELAND. Mr. Chairman, Ladies and Gentlemen: Doubtless I shall best commend myself to your favorable attention by an exceedingly brief speech.

These hours are opportune. The men who are gathered in this Convention have come full of sentiment, full of thought. I shall not consume your time by asking you to listen to me for any length of time.

May I not, however, gentlemen, in behalf of the City of Pittsburgh, bid you a welcome to our home, to our hospitality and to our city. Coming as you do, so full of richness and originality, one like myself could scarcely compliment you, but in the name of our city, whose humble representative I happen to be this morning, let me bid you welcome.

The PRESIDENT. I now have the pleasure of introducing to you Dr. Benjamin Lee, Secretary of the State Board of Health, who will reply to the address of welcome just delivered.

4.—Doctor LEE. Ladies and gentlemen: I could wish that to another than myself had been assigned the duty of replying to the eloquent words of welcome to which you have just listened. Following the "epea pteroenta", or winged words, as Homer delighted to call them, to which you have just listened, I fear that mine will sound laggard indeed.

So far as I know there is but one other man in the United States who is gifted with as slow a tongue as myself. That individual you have all heard of; he is as famous as I am wanting in fame—I speak of Mark Twain. It has been told me by a friend, that Mark said to him once that his slowness of speech was inherited, and that he always felt like saying to his mother that she spoke so very slowly he always wanted to say to her, "Mother hurry up." I always feel like saying that to myself.

Personally no more pleasant duty could have been assigned to me than replying to an address of welcome here in Pittsburgh. I always come to Pittsburgh with a feeling of enthusiasm. It has been, if I may

be pardoned the allusion, a pleasing thought to me that in my veins were some few drops of the same blood which flowed in the veins of the great English commoner for whom this city is named, and whose most famous utterance was, "If I were an American, as I am an Englishman, while a foreign troop was landed in my country I would never lay down my arms, never! never!! never!!!"

Pittsburgh is one of those places, as one visits it from time to time, which seems to have had an Aladdin present, rubbing his lamp. So astonishing are the changes which have taken place in this fair city since my first visit to it, when in attendance on a meeting of the State Medical Society, which will again next week hold its sessions here, that I almost feel as though I were in another city and another world.

When I look at your beautifully paved streets, at your magnificent system of lighting, at your rapid transit in cars which do not dislocate your spinal column every time you get into them, as certain cars do in a city I know of; when I look at your magnificient court house, a building which for architectural purity of style and solidity is not to be matched on this continent; when I ride out into your suburbs and see the palaces which have sprung up on every hand, I feel that really this is a city of enchantment.

It was my good fortune yesterday to visit a beautiful house in your suburbs--beautiful in its architectural design, beautiful in its location, exquisite in all its interior appointments. But what do you think my attention was called to in that house? Not to its beautiful adornments, not to its architectural arrangements and exterior, but to its cellar and, that in my opinion, as evidently in the opinion of the mistress of the house, was the chef-d'œuvre of the whole house.

A perfectly dry cellar! A beautifully lighted cellar! A cellar in which one could have sat down with perfect comfort in every respect to eat his dinner. That cellar meant a healthy house and a healthy home, and if there is one thought I would like to impress upon every householder present it is that in constructing his house he not only begins with the cellar in laying his foundation, but that the main idea of the house should be in the cellar, that the cellar shall be so constructed that the air which may possibly reach the house from it shall never convey the seeds of death.

I may be permitted perhaps, to call attention to certain criticisms which have often been passed upon all boards of health, and all health authorities, but especially upon state boards of health.

I have always noticed that the Pittsburgh newspapers were, with the exception perhaps of those of the city of New York, rather in advance of the newspapers of any other city in the country with which I am familiar. Picking up a Pittsburgh paper the other day I came across this little incident which seems to have occurred in this city:

"Bees this the Hilth Office"? inquired a hardened looking citizen with a gin countenance of Clerk Williams this morning.

"Yes sir," was the reply.

"Well, thin, Oi want some hilth. For the last twenty years Oi hav bin takin' a drap too much till Oi'm bruk in moi constatushun. Plase fix me up."

"If you want to be vaccinated, we'll attend to you, sir."

"Its vaccination you'd give me, is it? Well, Oi've been vaccinatin me stummick wid bad whiskey for many a year, and the treatment is not bineficial. No, sir, Oi want yees to give me me hilth again."

"My dear sir, we can't do it. Its not our business."

"Thin ye dhraw salary for chatin' the public. Oi'm a taxpayer. Gim me hilth."

"Can't."

"Wat?"

"Can't."

"Thin by the coattail of St. Patrick, I'll spile yhures by using ye to dust the flure and furniture," and he began to hastily remove his tattered coat.

"Hi! there, doctor, bring in that last small pox patient!" shouted the clerk.

There was a wild shriek of terror, the coatless form of the health-seeker vanished through the door, and an instant later he was making railroad time down Market street.

The smallpox case; it is proper to say, did not appear.

A great amount of the criticism passed upon boards of health comes from those who know nothing of their work, and cannot appreciate their labor. Those persons are found everywhere, and some of their criticisms are as senseless as their judgments are silly. There are others who oppose such Boards, because they cannot see any practical results follow their service. There is some reason for this, but a little study and investigation would remove the cause of opposition. The work of health boards is usually not seen because being preventive, it is only observable in the absence of that which it prevents from occurring. The non-occurrence of a disaster that would have occurred under different conditions is not seen, and, the disaster not occurring, the means that prevented it are unnoticed.

I might be permitted to mention here an instance of this kind which has occurred during the winter of 1887. The State Board of Health was notified, by its inspector at Wilkes-Barre, that the laborers on a railroad in process of construction near the city of Wilkes-Barre, were depositing all their filth of every kind—their personal filth, their kitchen garbage—upon the banks of the little streams which fed the reservoirs from which that city was supplied with its drinking water.

The Board at once issued orders to the railroad company, and to their contractor upon the line of the road, commanding them to remove all these deposits, to dig pits into which they could be thrown, with proper disinfectants, and forbid, from that time forward, any such deposits upon the banks, or in the neighborhood, of these streams. That order was carried out to the letter, so that every cause of pollution from this source was removed.

Now suppose no such action had been taken, what might reasonably have been looked for last summer in Wilkes-Barre would have been a repetition of the Plymouth epidemic; but no one except those few who hear this statement, will know of that escape. So it is that the Board of Health is daily criticised because people do not hear what it is doing. When the physician treats a patient and cures him, his services are at once recognized; but had the doctor prevented the sickness, the fact of its not occurring, would not only have made the services unrecognized, but would have caused a doubt of any services having been rendered.

In one sense the work of the sanitarian and of boards of health is of a negative character. It is preventive, and while, when it is successful it is not recognized, when unsuccessful we do recognize its want of success and call it inefficiency. When there is no sickness and no epidemic, we fail to recommend the labor of the health board, but when sickness or epidemics prevail, we manifest our appreciation of such boards' service by condemning it. We are always looking for immediate tangible results. We want something we can see, a change that is visible to the naked eye. We cannot look at the increase of healthfulness, and do not take the trouble to compare mortuary records, or read reports from boards of health. We see the products of manufactures, the results of the trades, and mark the course of industrial progress by its visible achievements—all matters that we can feel and see because here is something made, something produced, and not simply something prevented. And this I may say is especially a disadvantage under which the State Board of Health of this State labors. This Board has been endeavoring ever since its organization to obtain legislation which will give authority to an official in every township in the State to collect records of the mortuary and health conditions of that township.

Just as soon as our Board can obtain legislation of this kind, just as soon as we can have our feelers out in every portion of the State and get returns telling us what number of deaths is taking place, and what number of epidemic diseases is taking place—then we shall be able to lay before the people of this State such results as will show that the State Board of Health is good for something; but until we have these means of comparison we are so, to speak, helpless in demonstrating the value of our work.

On this point I would like to read a brief extract from an address delivered by President Luther Sexton of the Mississippi Medical Association at Jacksonville, Florida, in April of the present year.

He says, "In the meantime it will be decidedly advantageous to have a compulsory system of registration of vital statistics. Public hygiene grew out of vital statistics, and its existence depends upon them. Every argument for the creation and maintenance of our Board of Health is based upon them, and upon vital statistics our boards must make their record. Without them neither our past accomplishments nor future work can be judged. Is not the human crop of more importance, interest, and value than the crop of cotton and corn? Yet from every 10x12, "patent outside," country cross-road newspaper, we learn of the size of the cotton and corn crops and the current market prices of those commodities, but we look in vain through the columns of the most widely circulated and ably edited papers in the State of Mississippi for a list of marriages, births, and deaths, or any reliable items concerning epidemic diseases, or what efforts, if any, are being made to suppress the diseases. Vital statistics, as some one has said, furnish unerring lessons as to the health, prosperity, and morals of a people. They teach us the influence of marriage over illegitimacy, and immorality, the fecundity of the people, the number of children, and their vital force; the duration of life, its expectation and value of all ages and races, the influence of meteorology, locality, occupation, in producing diseases and impoverishing health, and thereby enabling us to remove unfavorable conditions found where and when least expected.

"Vital statistics tell us of the approach of terrific storms by which ignorant and negligent cities, and even nations, have been swept from the face of the earth. They constitute the bed-rock upon which life insurance is based; and when truthful and favorable, invite alike as immigrants the laborer and the capitalist. Though ignored by the average legislator, their importance has been recognized and respected by Napoleon, Bismark, Disraeli, and Gladstone of England, by such men as Harris, Jones, and Gibson, of the United States Senate. The establishment of a bureau of vital statistics is a pretty fair index to the degree of civilization attained by a people or by their law making representatives."

Pennsylvania has a Bureau of Vital Statistics, but it is absolutely without machinery for carrying on that Bureau. Until our representatives, and until our people throughout the State, became alive to this matter the Bureau of Vital Statistics of this State must be simply upon paper.

We have succeeded by offering a small compensation to registering officers in the counties in getting a tolerably accurate registration of the physicians in the State. We have also registration of some fif-

teen thousand marriages which have taken place in the State during the three or four years which the marriage license law has been in existence; but these of course are utterly insufficient to found any deductions upon.

The system of sanitation as established by the boards of health is too vast to be easily comprehended. The States are becoming so thoroughly organized that in many of them the organization extends to every town and township, and the first appearance of an infectious disease is at once reported and means adopted to prevent it from spreading. This system of compulsory notification is in itself of sufficient value to warrant the establishment and support of health boards. All of our principal cities are thus provided, and the results have been satisfactory. The improvements observable in New York, Boston, Chicago, Philadelphia, the southern cities, and, in fact all cities have proven the wisdom of the creation of these boards. The only trouble is, they are not given power and aid enough.

This opposition arising from the uninformed and prejudiced is one of the obstructions in the way of sanitary progress that should be removed. If a health board is not efficient it should be improved and not removed; and it is hardly necessary to add that if all the opposition and indifference to health boards were turned into friendly assistance, we should have better boards and a more efficient service.

I would like to call your attention for a moment to the comparative support which is given by the State of Pennsylvania to its Board of Health, and averages given by other states of the United States, and also to compare these figures with the comparative possibilities computing from the wealth of the different states.

(Doctor Lee produced a chart by which he illustrated his remarks.)

This chart represents sixteen states of the Union. You observe first New York, Pennsylvania, then Illinois, Connecticut, Minnesota, Rhode Island, New Hampshire, Alabama and Mississippi. Those who are unable to see the figures will be able to judge by the blocks in the card, of the comparative wealth of these states.

We begin with New York which goes up into billions, and finish with Mississippi which ends with 215,000,000. You have there Pennsylvania the second state in this column of wealth. I will show you presently the relative population of these states and you may be able to see New York, Pennsylvania, Illinois, Massachusetts and so on.

(Here the speaker produced a second chart.)

Here we have the population of these same states, beginning with New York with a population of over 5,000,000, Pennsylvania over 4,000,000, Illinois over 3,000,000, and so on until we get up to Rhode Island which has a population of 304,000. New York, Pennsylvania, Illinois, Massachusetts, Michigan, Texas, Wisconsin, New Jersey, Mississippi, up to little Rhode Island which crowns the column.

(Here the speaker produced a third chart.)

Now I confess that I feel a little hesitation in showing this; it almost makes me blush. Here we begin with Massachusetts.

These amounts I will state are the amounts which are available in each state for sanitary purposes. I do not mean to say that each state expends every year the amount put down, but the state board of health of each of these states could if necessary call upon the state treasurer to expend the amount which I put down in this column, and in many states the entire amount is expended each year.

We begin with Massachusetts which gives a grand total of $111,300; we follow with Texas which places at the disposal of its state board of health $61,000. We then have Illinois giving $49,000, Mississippi, $46,000, Minnesota, $29,000, New York, $25,000, New Jersey, $21,000, Wisconsin, $20,000, Michigan, $16,000, Alabama, $13,000, Maryland, $13,000, California, $12,800, Connecticut, $10,000, New Hampshire, $8,500, Pennsylvania, $5,000, Rhode Island, $2,700.

If I am not occupying too much time, I would like to call attention to the way in which the value of a state board of health can be demonstrated to the naked eye. The state in the Union which has done the best work through its state board of health is probably that of Michigan; certainly the best statistical work is done in Michigan. That state has reports every week from every township in the state. It compiles every week a record from these reports which it sends broadcast throughout the state.

May I interrupt myself a moment. I have discovered here in Pittsburgh, the most admirable system of notification of contagious diseases which exists, I believe, in the country. I understand that the city Board of Health of Pittsburgh has reports twice a week (it probably receives its reports every day from the physicians), of all cases of contagious diseases occurring in the city.

The Board makes up a brief statement from these reports in which it puts down every house in the city, in which a case of contagious disease has occurred. This report is sent to every teacher of a public school, and to every teacher of a private school in this city.

That teacher can put his or her finger on every house in the city, from which a child comes to that school in which a contagious disease exists. If a child is seen entering the school on that day from such a house, it is at once given notice to go home. Now there is nothing like that in the United States elsewhere.

This is a chart which makes visible to the naked eye, the epidemics of diphtheria which occurred in Michigan during one year. It is lettered up the side from one to sixteen: these letters indicate the number of cases which occurred in each epidemic, taking the average throughout the state.

We have four columns. In each of those four we have a column for cases and a column for deaths. The first column shows the entire average of the state. The second column shows the cases and deaths, in which reliable information was not furnished to the state board, as to what precautions had been taken to check the epidemic. Precautions may have been taken and they may not have been taken. The third column shows the cases in which it is known that no precautions were taken. The fourth column shows the cases in which owing to proper following out of the instructions and rules of the State Board of Health precautions were taken.

Now I think you will see that this chart demonstrates to the eye that the state boards of health and Sanitation are useful. Here we have the average number of cases in the entire state—all the epidemics occurring were seven. The average number of deaths was about one and a half. In the cases where no reliable information was obtained, the average number of cases was about four and a half, and the average number of deaths one. In cases where it is known that no precautions were taken, th eabsolute number of cases was sixteen, and the number of deaths upwards of three. In the cases where precautions were taken, the number of cases was less than four, and the average number of deaths less than one.

Will you allow me to terminate this very dry talk by quoting, with slight alterations, from a poem by America's favorite poet. I have introduced one word, which is a substitute, and which you will perhaps recognize.

"Who cometh over the hills,
Her garments with morning sweet,
The dance of a thousand rills
Making music before her feet?
Her presence freshens the air,
Sunshine steals light from her face,
The leaden footsteps of care
Leap to the tune of her pace.
Fairness of all that is fair,
Grace at the heart of all grace.
Sweet'ner of hut and of hall,
Bringer of life out of naught,
Hygieia, oh, fairest of all
The daughters of Time and Thought."

The PRESIDENT: I am sure you all enjoyed listening to the very valuable paper that Dr. Lee has given us. I certainly hope the public will have an opportunity to read that paper, and to see those charts which express a great deal more than words can say.

Before proceeding with the regular business of the convention, I would say that I am instructed, by the authorities of the Homeopathic Hospital, to invite all of our visitors to the city and their personal friends, to come to the hospital while here and inspect it; and I can

say in reply to a remark made by a gentleman that I would advise him especially to go into the cellar. He will find that that building was commenced right.

I now have the pleasure of introducing to you Dr. J. F. Edwards, of Philadelphia, who will read a paper on Cellar Air in Houses, prepared by Rev. Dr E. H. Supplee.

5.—CELLAR AIR IN HOUSES.

By Rev. E. H. SUPPLEE, Ph. D.

While making a casual call upon the worthy secretary of this Board, I incidentally gave some of my personal experience in reference to the "Cellar Air in Houses" in Philadelphia. As I was about to leave, he asked me if I would not put some of these plain and simple facts on paper, just as I had related them to him, and present them at the next meeting of this Board. I consented to do so, but time passed without a line being written until within a few days of this meeting.

Thirty years ago my attention was especially directed to this subject from the importance of having pure air in the rooms of my private school for young ladies in the Quaker city. For obvious reasons, I shall not give the numbers or the residences to which I may refer, but will indicate their general locality.

Property owners seem to have an aversion to renting their houses for school purposes. Probably this may arise from the recollection of their own school days when scribbled walls and carved benches were so generally associated with school rooms. So it happened that in two cases in three, I was glad to get five large houses in the best localities, that had been occupied as boarding houses. They were respectively on Green, Arch, and Spruce streets, and all near 17th. The rent ranged from $1200 to $2000 per year. On special inquiry, I found that death had visited every one of these houses just before they had been vacated; some of these visits I now believe were consequent upon dirt, defective drainage, and the breathing of vitiated cellar air. The houses were thoroughly cleansed and renovated before being occupied for school purposes, and in the first two instances provision was made at once, (though it was summer when possession was taken) for securing fresh out-door air for the registers in all the rooms. One of the furnaces in the third and last house had a proper cold air flue, and being very busy, I left the other, thinking to introduce it in the early Autumn. But an early and temporary cold wave arrived before it was attended to.

On taking possession of the first and second houses, I found the

cellars in a very filthy condition, and no provision for obtaining fresh air through the furnaces. This cellar air had always been breathed by the boarders and other inmates. And I was subsequently not surprised to learn of the malignant fever that more than once existed there. Desiring the air in the school rooms at all times as pure and fresh, as the external air of spring, if possible, I immediately provided for this by cold air pipes, and devised a proper system of ventilation. The third house to which reference has been made, had been occupied by the owner who had lost his only child there. The boy died of typhoid fever. One of the furnaces in this house was of the kind, called portable. It contained no cold air flue from outside the cellar. As already intimated, it was my intention to have one introduced before winter. But the cold weather came so suddenly and so unexpectedly in the early autumn that fire was made temporarily without it. This furnace heated three rooms in the rear of the residence, in one of which the owner's child had sickened and died. A young lady in my family, afterwards occupied one of these rooms. It had been thoroughly cleansed and newly papered; she was taken sick with symptoms of typhoid fever. The part of the cellar in which the portable furnace was placed, was damp and appeared springy; but an unpleasant odor arose from the moisture. On calling the attention of the landlord to this fact, I was almost overwhelmed with surprise and amazement when told that it was from a cess-pool dug to receive the substance from the closets of two bath rooms. The dampness of the cellar around this well, showed how fallacious was his remark, that "it was hermetically sealed." There was no sewer in the rear of these houses into which the excrement from these closets in the bath rooms could be carried away. And this death trap had been permitted to exist for many years, before I went into it, while it cost only $13.50 to have a tin pipe to introduce fresh air outside of the cellar into the house. The lady was removed from that part of the house and recovered. A sewer was soon introduced along the street in the rear of these premises, and all the waste pipes connected with it. Proper ventilation was also put into the bath rooms themselves.

This is some of my personal experience with reference to the quality of the air which is breathed in some of the larger and more fashionable residences in Philadelphia. In the meantime, my attention was very frequently called to the subject in houses near those which I have mentioned. I have been astonished to hear of families living near me, paying from $2500 to $3000 rent, without any better facilities for ventilation, drainage and fresh air than those in which I resided. But I am not surprised to have learned of the many cases of malignant fevers, often resulting in death among these families. Wherever it has been prudent or possible, I have given the result of my own experience, and

have frequently been delighted to learn that a proper system of sewerage and drainage together with the introduction of fresh air has been secured.

My experience and observations do not end here. When we come to smaller residences, the evil seems to increase manifoldly as the size of houses decrease, until we come to the smallest and cheapest, which are usually heated by stoves. With moderate sized houses, say, of ten or eleven rooms, and renting for five or six hundred dollars per annum, I would not be surprised to find, if about nine tenths in Philadelphia, especially in West Philadelphia, were left without any facilities for obtaining fresh air for breathing, outside of the cellar. After closing my school, in 1884, I have spent one half of every year at the sea shore, Cape May Point, N. J. During the winter, I have rented different houses of the moderate size, just mentioned, but not one did I find in searching during the last five years with any means provided for obtaining air for the registers in the rooms, except through an occasional open or broken cellar window.

I rented only on condition that cold air flues should be introduced, which was done with trifling expense. Four of these houses, all of which were on prominent streets in West Philadelphia, had cellars in a condition but little better than my Spruce street house just described. There were indeed no cess-pools in the cellar; but the waste pipes from the bath room closets leaked, and the drainage was so poorly done, that sewer gas was constantly perceptible. After heavy rains, the cellars in two of these houses were flooded with water of putrid smell. Every one of these houses had been occupied for many years by different families, sickness and death, I found, had more than once visited them. In one of them it was more inconvenient than usual, to introduce a cold fresh air flue into the rear furnace, and I consented to go into the house without it. From this cause, or from some exposure, one of my family was visited with a very malignant attack of diphtheria.

Such, in the fewest possible words, is some of my own experience and observation in the matter of impure air in our city homes. If it is said why did you select such homes, I reply that nearly all that were for rent on these occasions were in the same unhealthy condition. And I have good reason to believe it is so still, so far as fresh air is concerned with rentable houses of the size of those I last occupied.

So sensitive have I become to the impurities of cellar atmosphere, that I can generally tell immediately on entering a house, whether or not it passes through the registers. Frequently when I have been requested, as a minister of the gospel, to visit families in sickness, have my suspicions that the patients were breathing poisoned cellar air, been verified by inquiry and actual observation. Often when called upon to officiate at funerals in different sections of the city, have I felt, when reading the words of Job, "The Lord gave and the Lord hath

taken away," that if the departed had only been permitted to breathe more of the pure fresh air, which the Lord gives so freely and bountifully to all who will receive it, the corpse perhaps, would not now be lying in the coffin before me.

The PRESIDENT. The paper just read is open for discussion. I will give you an instance of what actually occurred in Pittsburgh. There was at one time on the hill above the city, which appears to be such a perfectly healthy locality, an epidemic of a very mild type of scarlet fever.

There were no deaths in the neighborhood that I know of. The disease was exceedingly mild.

But suddenly in one house the whole family were attacked with malignant scarlet fever. There were no children in the house. The disease resulted in one death, permanent injury to the health of another person, and, I think, eventually the death of a third, which occurred a few years later. The family, as soon as they were able, moved out of the house to the mountains; and the head of the house asked me if I would, as an engineer, look into the sanitary condition of that house, which I did.

It was an old house and there had been built in the rear of it a two story brick annex, which contained a kitchen and wash house and above it one or two sleeping rooms, and a bath-room. The old style sanitary plumbing had been put in. Up stairs there was a bath tub, water closets, waste sinks, and also some wash basins in one or two of the main bed rooms in the house.

This building had been set on the ground without any cellar, the floor being placed about three feet from the ground; there were no openings in the walls, no windows in the place at all. The main sewer pipe had been carried under this floor into an old well, which was used as a depository for all the waste from the house. This was a six inch sewer pipe, and it came in under the wash room and ended right under the kitchen stove; branch pipes being carried out from the various closets and sinks in the house. The end of this six inch pipe was wide open, not stopped up at all, so that all the gases coming from this cess pool were delivered immediately under the kitchen stove. There were no traps in the waste pipes in the house at all; and in addition to all this, there had been a trap door left in the laundry room to enable the plumbers to get down underneath to get at these pipes, and the whole offal of the kitchen had probably been thrown in there for a year or more putrifying, of course without the knowledge of the ladies of the house.

It was as much as the life of any person was worth to go in there to clean that place out and put it in shape; and it don't require any imagination to know where that disease came from and what caused the deaths in that family.

That was one of the largest and best houses on our hill. There is probably a good deal more of that kind of sanitary work around the city yet.

Dr. GROFF. If I understood the paper of Rev. Mr. Supplee, he proposes to obviate the difficulties from bad cellars by putting in fresh air pipes to supply the houses with pure air.

I hold, with Dr. Richardson of London, that dirty cellars are one of the greatest evils that we have to contend with at the present time. In the house that Dr. Lee spoke of a moment ago in the city of Pittsburgh, I do not think it is necessary to have fresh air pipes because he tells us the cellar is a good enough place to live in, and eat in. If we can live or eat in it, what is the need of having fresh air pipes to supply the cellar with fresh air. The cellar is supplied with air, I suppose, as the other rooms of the house are. We do not have fresh air pipes into every room. In other words the cellar should just be as clean as any other part of the house, and if it is as clean as any other part of the house it will be as healthy as any other part of the house.

But even if fresh air pipes are in the cellar to supply the furnace and the cellar is dirty, that dirty air is bound to go through the house and you can't keep it out. The dirty air of the cellar gets up above and it is no remedy to keep the cellar dirty and to put flues in to supply the furnace with good air.

We must either entirely abolish the cellar, as Dr. Richardson suggests, or we must have the cellar as clean as any other part of the house. In order to have a cellar properly lighted and flooded with air, and clean, it must be above ground: the under ground cellar must be abolished.

Dr. PEMBERTON DUDLEY. I agree with the statement made by Dr. Groff. I have been delighted to visit the house which Dr. Lee mentioned, in company with him, and I must say that I was just a little surprised as I went through that cellar to observe that there was a large free air passage from the outside. But we must remember that cellars are liable to accident.

In most of our houses, and above all in cities, towns, and villages, it is not enough that the cellar be clean. The cellar may be as clean as the parlor and yet it is not safe, if it is in the city or town, unless it be made impervious to ground air. It is true, and it ought to be impressed upon us fully, that in a city, or town, ground air is just as much impregnated as ground water, and who would think of drinking ground water from a city? In cities the soil is of course, all impregnated with the surface decomposition and with the leakage of cess pools and of sewers, and you cannot keep this out of the cellars except by having all of the cellar made impervious to air, a thing that is not so easily done as some may imagine.

You may have your cellar clean, you may have it well lighted, and

still you have no assurance that it is absolutely clean from pollution by the surrounding ground air.

I believe that very much of the sickness of Philadelphia, of which there is entirely too much, is due to two causes, first pollution of the air--of the cellar air, which, as Rev. Mr. Supplee says in his paper, in the great majority of cases is drawn up into our living rooms, and secondly by the impregnation of the air which reaches our cooking room from neighboring cess pools. I believe these two causes lie at the base of a very large portion of Philadelphia's avoidable disease, and I have no doubt also at the foundation of the avoidable disease of the citizens of cities and towns generally.

Let us insist upon it then that we shall first of all have our cellars absolutely clean; that they shall be made as practically impervious to the surrounding ground air and ground water as possible, and that, in addition to that, we shall provide all our cellar heaters with suitable conduits for bringing the air from the outside.

Mr. MURPHY. Ground air is an extremely important thing in considering the sanitary condition of our cellars. I will just add to what he has said this idea which may not have occurred to all of us in thinking of that subject. The earth breathes very much like a human being. When there has been very little rain for a long time the water which has been stored in the interstices of the earth passes away and the vacuum created is immediately filled with air, and then if stormy weather comes on, the rain water falls immediately upon the surface of the earth and descends, while rain water from a distance is carried, by subterranean channels, to some open recess; the air filling these interstices and in between the two bodies of water, must be squeezed out, perhaps it will bubble up through the water which is passing into the vacuums or, if a cellar or well or anything of that kind happens to be a little more accessible it is more naturally squeezed out in that direction than forced up to the surface. That is it is probable that the line of least resistance is through the cellar, consequently just after a long dry spell, when certain matters in the earth have come sufficiently in contact with the atmosphere to become very much polluted, is just the time when this air is likely to be forced through the cellar, and up into the house, if there is any connection with the hot air conduit. Just after a heavy storm this foul atmosphere will be forced into the cellar and forced up into the house just by the simple displacement of the air by the rain water.

Dr. SIBBETT. There is a thought I would like to present on this subject. There is a general idea among our people that diseases are brought to us from a distance. Now there is nothing, as I look at the subect, so fallacious as that. The people believe diseases come over the mountains or from a distance, it may be over the fields or it may be from some distant swamp.

Now according to my notion, this is a very prevalent opinion. I believe the medical profession has spoken and written so much on the subject of epidemic diseases and epidemics in the atmosphere, that the people have got to believe they are in the atmosphere. The public press might do a great deal to improve the minds of the people on this subject. Now my idea is that disease is found very near to our homes.

But as to this cellar question, I wish to speak a word on that. The cellar is, I apprehend, a very common source of disease. We have had reference to the means by which diseases get into the cellar. It is generally understood that keeping a certain amount of vegetable matter in the cellar, such as cabbage and potatoes, for a number of months will generate disease. This is very commonly accepted and understood by people. There are certain other things that are not so well understood which I wish to emphasize.

It happened during this last year that I was thrown into relationship with a party living in a new house, built but a few years ago, with everything apparently complete. I noticed from day to day the kitchen servant taking out the wash water from the kitchen and throwing it just at the foundation—and it was all running into the cellar, down between the earth and the foundation. This was kept up, I noticed, for days, and weeks and months. I mustered up courage one day to say to the proprietor that possibly that would generate typhoid fever or scarlet fever in his family next summer. It was rather a new idea to him but he said he would speak to his family on the subject.

I merely mention this to show that there is a great deal of this done. It is not generally supposed that simple dish water, dropped at the side of a wall, will, in course of time, produce disease; but I apprehend that disease might arise from just such a cause as that. Dropping a basin of dish water at the side of a house seems to be a very simple thing, but if we will consider the fact that rain comes frequently, and washes the dish water and a great variety of things you can imagine, right into that cellar, by and by we have a case of scarlet fever there, and the doctor is at a great loss to know what is the matter. He goes down to the cellar and sees no garbage there: he does not find any bones about, or any broken tinware, or anything of that kind around.

Perhaps he would find the source was just something like that, the foundation of the cellar has become impregnated with this kitchen wash nothing more than that. I think that most of the refuse of the kitchen is sufficient to produce typhoid fever, scarlet fever and other diseases.

I want to call the attention of the Convention to the fact, that the cause of disease is very close to us. We must not look across the mountains, or over our neighboring fields but right at our homes, where we inhale the atmosphere every day and every night. This is too often overlooked: I believe it is very seldom thought of. Intelligent people

are ignorant of this fact, that the cause of disease is right in their cellar, right at their homes, or very close to them.

I could go on and say we know to a certainty that small-pox poison is not conveyed more than two or three rods. We know that where there was small pox on one side of a street, people were perfectly safe across the street. So that diseases are not carried in the atmosphere, as people generally suppose, and as the medical profession supposed for many years; but they are much closer to us than that. If it is not a personal thing to us, upon our own clothing, it is in our cellars, kitchens or bedrooms or somewhere about the house where we are in very close contact with it.

The PRESIDENT. Professor Henry Leffmann will read a paper on Fermented Beverages of Low Alcoholic Strength commonly known as "Soft Drinks".

7.—NOTES ON FERMENTED BEVERAGES OF LOW ALCOHOLIC STRENGTH, COMMONLY KNOWN AS "SOFT DRINKS."

By HENRY LEFFMANN, M. D.

I have often noted, and with some surprise, the limited attention that is given in sanitary literature and in the proceedings of sanitary conventions to the subject of alcoholic beverages. Even such comprehensive considerations of the science as are given in the annual meetings of the American Public Health Association, rarely include more than a passing allusion to it, although occasionally papers of much value appear. This neglect is surely not due to the non-importance of the topic, for there are few, if any, causes of disease more serious than the use of alcohol. While we may view with mistrust and even contempt the assertions and some of the efforts of professional prohibitionists, we cannot deny the general advantages of total abstinence. It is not unnatural that those who are deeply interested in a reform movement will occasionly be overzealous, and that the liability to such zeal will be most marked in causes of greatest and deepest interest. That the movement which is now manifesting itself in various parts of the world, but particularly in English speaking countries, in opposition to all use of alcohol is a reform movement of great vitality and force can not be doubted for a moment by any one who is observant of it.

To the question what are the reasons for the general use of stimulants no very positive answer can be made. The argument that such general use indicates a physiological necessity, is entirely without value, for a similar reasoning could be made to justify many habits which are known to be injurious to body and mind. The positiveness with which an opinion in dietetics is asserted by eminent authorities is no demonstration of its truth. We have only to look over the current of medical

history for a brief period to see the most opposite views dogmatically asserted. It can hardly be denied that with many persons the use of stimulants is a mere matter of imitation. As soon as a child begins to partake of the regular food of the family the accessory articles, coffee, tea, cocoa or even alcoholic beverages are placed before it. The habit of drinking coffee or tea is a mere dietetic vice, although we may think that we have some recondite physiological basis for it, but it is like the German custom of eating pork raw, a habit derived by example. The stimulants in common use are mostly agreeable to the palate, and it is in this property that we have the main cause of their extended use. It is not at all to be wondered at that the delightful aromas of coffee and tea should have made them favorites with many nations. Men and women use these articles because they like them and not because of any instinctive demand for them. Some experiments have indicated that raw meat is more digestible than cooked meat, but a knowledge of this fact is not likely to lead to an entire abandonment of roast beef as an article of food.

The chemistry of the formation of alcohol is now well understood. It is no longer regarded as a spontaneous product. It is a process, however, which can be easily brought about, by simple exposure to the air, of liquids containing sugar. If we attentively consider the subject, I think we can give mankind credit for not being given to the use of such beverages wholly on account of the alochol formed. All alcoholic fermentation is accompanied by the production of a certain amount of carbonic acid, which occupying a large volume gives to the fermenting liquid an agreeable effervescence and pleasant effect. The progress of science has placed in our hands mechanical contrivances which enable us to produce effervescent beverages without the simultaneous formation of alcohol, but such operations are practical only on the large scale. The home manufacture still is limited to the old method.

In the days of irregular and unrestricted traffic in all classes of alcoholic beverages, now, I hope, happily passed away in this State, but little attention was paid to the character and effects of the so-called home-made beers. Something has been said from time to time by medical writers concerning the domestic wines and brandies made from fruits, but these do not come within the province of this note. I may, however, say, in passing, that all these articles such as blackberry, and elderberry wines are less suitable for use than true grape wine, and that from a chemical point of view the grape is the only wine-bearing fruit. It is, however, with the very light fermented drinks that we are here concerned, those known familiarly under the name of spruce beer, and other fanciful titles. Their production is simple, the fermentation being carried at a low temperature.

The rigidly restrictive language of the new license act has placed the manufacture and sale of these articles on a new basis, and it has been

in consequence of some association with the legal difficulties growing out of such sale that my attention has been especially directed to their character. The general ignorance as to the nature of alcoholic beverages is remarkable. I have several times in the course of popular lectures shown the distillation of ordinary lager beer and the alcohols obtained, and have had persons of apparently fair intelligence express surprise at the existence of appreciable quantities of alcohol in such articles. Still more is it likely that many persons consider that spruce beer and mead contain no alcohol. As a matter of fact the per centage varies from say .5 of absolute alcohol up to 1.5 to 2 per cent. Ordinary beers contain from four to six per cent. Ambrosia, a light beer, which has figured rather largely in the courts in Philadelphia, contains from 1.5 to 2 per cent, rarely, probably, exceeding the latter figure. An important difference must be noted between the domestic beers and such articles as lager beer, ale and porter. The latter are malt liquors, and their production is a definite chemical process, the results of which are under complete control, in other words they are brewed. The home-made articles are largely hap-hazard products, made without malt, and no more of the nature of brewing than is the making of a light dough by the use of yeast.

Recognizing then the simple chemical character of these beverages, an interesting question arises as to their intoxicating qualities and wholesomeness. What constitutes an intoxicating drink has often been a matter of both medical and legal dispute. The determination of this point does not come into question under the present law, as the license is required for the sale of "spiritous, vinous, malt or brewed liquor or any admixture thereof." The general public opinion is still based on the older consideration. Physiological experiments have rendered it probable that a quantity of absolute alcohol amouting to 1.5 ounces in the twenty-four hours is the limit which the healthy male adult can use up in the system. If more than this be taken some of it will appear in an unchanged form in the excretions. We may consider therefore that the consumption within twenty-four hours of an amount of any fermented beverage containing more than 1.5 ounces alcohol would establish a condition of intoxication in the scientific sense, although the mental and muscular evidences might not be at once apparent. When we bear in mind that one-third at least of the twenty-four hours is practically obliterated in sleep, we see that we must reduce the limit just given to one ounce and we may say that over this amount of alcohol taken between the hours of breakfast and bedtime will be an instance of alcoholic excess. Now, if we consider lager beer we find that it contains at least four per cent. of alcohol, hence twenty-five ounces will contain the limit of absolute alcohol, and since it is quite easy for a regular beer drinker to consume this amount, (about one pint and a half) in the course of the day, a quantity of alcohol beyond the physiological limit can be

easily reached. Such beers must therefore be considered intoxicating. When, however, we come to consider lighter beers, such as ambrosia, two per cent. or even lower, the quantity required would be so great that it is doubtful, whether it would be possible to consume it, and when we pass below the proportion of one per cent. we certainly cannot consider the liquid intoxicating. Thus of a liquid containing one per cent. of alcohol one hundred ounces, over three quarts would be required to reach even the lowest physiological limit. The low alcoholic strength and limitation of fermentation very much diminishes the craving for such liquors, and in almost all cases a sense of surfeit would be produced before an intoxicating amount would be taken. It is the character of beverages of decided alcoholic per centage that they do not usually produce a sense of satiety and satisfaction of appetite which is noticed with true food and this I think is an important evidence that alcohol is not a true food, although it is a fact often overlooked. Deciding then the adjective "soft" in its popular sense is properly applied to these beverages it remains to speak concerning their wholesomeness. I think we must decide this in the negative, although the degree of unwholesomeness is not very great. While we have no positive evidence that alcohol in this quantity is injurious to all persons, there can be but little doubt that it does no good when used in this form, and to many persons it is positively harmful. It is true that such drinks are not likely to be used in excessive quantities at any time, yet their flavors are somewhat seductive, and it is easy to establish a habit which may in many cases lead to digestive disturbances. They are necessarily crude and irregular in their preparation, possess no nutritive nor digestive functions, and contain, in those cases in which yeast is used freely in their preparation, a considerable amount of fermenting organisms in active condition. The aim in their preparation as mentioned in the beginning of the essay is to secure an effervescent beverage. The pleasant and perhaps beneficial effects of carbonic acid can be secured in a more satisfactory manner by the artificial effervescent drinks in which solutions of known character are employed. The cheapening and simplification of the aërating methods is a line of invention deserving of attention, and it is to be hoped that we may be able to secure some system which will permit of the domestic manufacture of unfermented "soft" drinks.

DR. LEE. Mr President: If there are no remarks on that paper, I would like to say a word in regard to the little instrument which I hold in my hand. We are very careful to have thermometers in our sick rooms, and by their means we are enabled to determine whether the temperature of the room is such as will be beneficial to our patient. We also have thermometers so arranged that we can determine the temperature of the patient himself. But we have not as yet had any means of determining the purity of the air of the sick room.

man physician named Wolpert, and is recommended and indorsed by Dr. Abbott, Secretary of the State Board of Health, of Massachusetts. It consists of a test tube on the lower end of which is affixed a little black mark, the lower end of the test tube being whitened. As you look directly down through the test tube you can see the black mark distinctly.

If you fill the test tube up, to a point where there is a line scratched upon the glass, with pure lime water—ordinary lime water just as you get it from the druggist—and then take this India rubber bulb in your hand, and squeeze out its contents, and allow it to fill itself from the air of the room and then introduce it into the lime water, and squeeze out the air, the number of times that will be required to produce such a turbidity in the lime water as will entirely obscure that black mark will indicate the degree of impurity of the atmosphere in the room.

If there is an impurity above fifteen bulb fulls, it indicates that the air begins to be suspicious; if it reaches 25, the air of the room is very bad for a sick person to breathe. This, of course, indicates simply the amount of carbonic acid in the temperature of the room. It is a test for that, and nothing more. I have now subjected it myself to these tests. I have breathed into it in this way (indicating) three times and injected it into the lime water; it becomes so turbid that I can no longer see the spot.

I was heating my office the other day with a gas stove. A gas stove, as you know, sends all the products of combustion into the room; there is no escape for them by way of a pipe. I found upon using this test that the air of my office was in such condition, that on injecting twelve bulbs full my solution was so turbid that I could no longer see the mark.

The test is therefore, one that can be perfectly well used by any person; it requires no particular tact. All that you have to do is to introduce your lime water into the tube, squeeze out the air that is in the bulb, and introduce it into the tube, being careful to keep up the pressure until the removal of the tube from the water, in order that you may not suck up the water. As I said the number of times which you require to produce sufficient turbidity to conceal the mark indicates the comparative condition of the air of the room.

Dr. ATKINSON. I would make one remark in reply to what Dr. Lee said relative to this instrument. It commends itself to us, because it gives us a sort of relative proportion of carbonic acid in the foul air. So far it does what we want in regard to carbonic acid; but sir, unfortunately it includes with that no means by which it will give us the amount of that poison which we have recently been able to detect in the recesses of the air, as given forth from the lungs, and by the exhalations of the whole system. That itself is a poison of greater importance than the carbonic acid gas.

And again it does not give us, nor do we yet have, except by means of the microscope—which every one of us is not able to use on all occasions—an opportunity of knowing the presence or absence of certain microbes which are now beginning to give us a great deal of alarm, as we are able to know that they are a source of disease.

I merely mention this fact, sir, so that those who may have noticed the exhibition of my friend (Dr. Lee) may not feel that we have gotten all that we may require in order to test the purity of the air.

Dr. LEE. I wish to announce that I have received letters of regret from the following persons:

Preston H. Bailhache, U. S. M. H. Service, San Francisco. Dr. Fred. Cross, Kingston, Pa. Hon. J. K. Newell, Wyalusing, Pa. Hon. John B. Donaldson, Canonsburgh, Pa. Hon. Geo. W. Neff, Masontown, Pa. Hon. James W. Walk, M. D. Philadelphia, Pa. Hon. G. M. Wherry, Shippensburg, Pa. Hon. John Donahue, Philadelphia, Pa. Hon. Lafayette Roland, Pa. Hon. W. H. McCullough, Tarentum, Pa. Hon. Chas. Moore, Pottstown, Pa. Hon. P. S. Weber, Du Bois, Pa. Dr. W. J. McKinnon, York, Pa. Hon. Geo. S. Wood, Muncy, Pa. Hon. Francis Cole, Arendtsville, Pa. Hon. J. B. Showalter, M. D., Millerstown, Pa. Hon. W. R. Swartz, Duncannon, Pa. Hon. H. W. Brown, Adamsville, Pa. Hon. W. McK. Williamson, Huntingdon, Pa.

On motion adjourned.

SECOND SESSION.

The Convention was called to order by President Metcalf.

The PRESIDENT. I now have the pleasure of introducing to you Col. P. Roberts, who will read a paper on the future of our rivers as sources of water supply.

THE FUTURE OF OUR RIVERS AS SOURCES OF WATER SUPPLY.

By Colonel THOMAS P. ROBERTS.

Modern civilization has made it possible for a much greater density of population, in some portions of the earth, than could have existed on the same areas in ancient times, or than was possible, even at the dawn of the present century, before the advent of the railroad and the steamship.

It certainly would not have been possible in ancient times for inland cities the size of Paris, or Berlin, to have existed, and it is believed, by local political economists, that the population of Pittsburgh and Allegheny county, now somewhat over 500,000, could not be supported

This little arrangment has been contrived for that purpose by a Ger-

by the surrounding country within available reach by the old time system of wagon transportation. As it is now, the products of the entire continent can be made available at any point, and cities are springing up entirely regardless of the capacity of the country about them as food producers, so that while the question of food supply for our cities is a matter of little concern, we are not so fortunate, in the case of many of them, as regards their water supply.

It is indeed, remarkable, that the question of the supply of good drinking water for millions of our population should have become a problem of importance, before any alarm is experienced concerning the food supply, nevertheless, such is the fact. The trouble, of course, does not originate from an actual shortage of water, so far as volume is concerned, but arises from the new ways of living and supply of artificial wants.

Water in enormous volumes is so essential, in many branches of the arts, and refuse, or waste, returning from the manufactories to the streams is so great, that we are simply spoiling our rivers as sources of a pure water supply.

Many of the minor streams have been absolutely unfitted for any use, and while in such cases, where the pollution comes almost wholly from manufacturing establishments, such as coal washers, etc., it may bode no evil to public health; there are cases of others which create just cause for alarm. It is to be remembered further in this connection, that the sewerage system is just dawning upon legions of the smaller cities.

Worse than manufacturing refuse, is the modern system of city water supply and sewerage, as in Pittsburgh, for instance, where the water daily furnished amounts approximately to two hundred and thirty (230) gallons per capita.*

The writer may be wrong, but has sometimes thought that the common notion that the liberal use of water in our great cities is indicative of cleanliness, is a popular delusion. Every one recognizes the great convenience of street sprinklers, bath-tubs, drains and sewers, in fact we have come to regard them as necessities; but too frequently the very person who will subscribe for water bonds, and spend hundreds of dollars in piping his premises, considers himself defrauded when assessed for sewers, and slams the door in the face of the first sanitary engineer who criticises his plumbers work. A meter system for water in our cities, would no doubt, be the means of closing leaky spigots,

*This is inclusive of a number of private pumping establishments which supply several millions of gallons daily to manufacturing establishments. In the aggregate there is pumped fully 55,000,000 gallons of water daily for Pittsburgh, (exclusive of Allegheny), or about 230 gallons per capita. No other city in America uses more water in proportion to population than Pittsburgh, excepting perhaps New York. Pittsburgh, however, forms no exception to the general rule of cities of a ratio of increase in the demand for water much in excess of the growth of their population.

and thereby, in that one item alone save half the wastage of water, and while it would be a good thing, financially speaking, its effect in reducing the contamination of our rivers would likely be small.

In the city of Rio de Janeiro, until recently, the water supply for upwards of 300,000 people, came from the mountains in an aqueduct the capacity of which would have been insufficient for the supply of a good sized ward of an American city.

There were a few public fountains, and from these the water was carried on the heads of the slaves to the dwellings. Under such circumstances bath-tubs, sinks, drains and sewers, could not exist; while the universal rule for closets was the dry earth—or closed jar system—emptied nightly in the harbor.*

Still the better parts of that city, so far as general cleanliness was concerned, compared favorably with the best parts of our average American cities. There were "slums" in Rio but the dirt about them was dry, excepting, we should add, during several months of rainy season; but such things as "festering gutters," and, of course, "sewer gas, and defective traps," were unheard of terrors.

It would, however, be folly to oppose the modern system of liberal water-supply, now so generally adopted in American cities, but nevertheless it will not do to forget the responsibilities which devolve upon us in our wholesale use of water.†

It is well established that moisture with warmth afford the requisite conditions for rapid propagation of many forms of microscopical life, hence the opportunities for the development, and transplanting, of the organisms, is vastly enlarged where water is carelessly used, and yet with a full knowledge of these facts, we permit our creeks and rivers to become the depositories of the filth and rubbish of our cities, in the sublime faith that by dilution with uncontaminated water, oxidation

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*It is rare that an epidemic of yellow fever in Rio leaves the shipping, or the immediate neighborhood of the shores of the harbor. It would occur to the writer, who spent several years in the neighborhood of Rio that the garbage furnace system, if introduced there, might play an important part in mitigating the yellow fever epidemics.

† It is stated as a fact that the "Point district" of the First ward of Pittsburgh, which is wholly without sewers, and where the population is very dense and confined chiefly to miserable tenements, has never experienced any serious epidemic of disease, while very serious, and sometimes unaccountable, epidemics of typhoid fever and cholera have ravaged other portions of the city served more or less perfectly with sewers. However, the case at the "Point" is somewhat peculiar; it is supposed that the river floods, which may occur several times during the year, by infiltration through the alluvial substratum dilutes, and carries off, with the decline of the waters, all the soluble impurities. In other parts of the city and in Allegheny, however, the infiltration of flood waters through the sub-soil is sometimes followed with sickness. It would not be safe to infer that the health of the Point district might be worse with sewers. Sewers, of course, mean more perfect drainage and multitudes of instances, could, no doubt, be cited where their construction has been followed with the best results.

and other natural operations, they will become innocuous as a vehicle for the propagation of disease.

Air and sunlight accomplish wonders for the benefit of the human race, but our knowledge of nature's processes are so imperfect that we are apt occasionally to make fatal mistakes in relying too much on her generosity. The vast number of innocuous forms of animal and vegetable life which enter our rivers from the sewers, may bring in themselves the means for the destruction of germs which accompany them, known, or suspected of being, capable of working an injury to human beings.

This phase of the question has some argument for support—but all the desired facts, are probably not determined. There will always be a chance, one would think, for stray pathogenic germs to be pumped back to the water works, or consumed, by boatmen or others. It should rather be a warning for us when we find our streams stocked with animalculæ, and developing rapidly on the food supplies which it may contain, that the conditions are favorable for some "wolves" among their numbers to be concealed in ambush—we certainly should not depend on them destroying each other.

In 1866, or 67, the late distinguished Prof. Joseph Henry, advised the introduction into this country of English sparrows because of their known insectivorous habits. He wrote this too from the same institution which contained Spencer F. Baird, as famous then, as an ornithologist, as he was later as an ichthyologist. He was perhaps led into the mistake because the birds lived in a country where "good meals" were beyond their "purse," and were accordingly compelled to forego the gratification of their really omniverous tastes. So we might be sometimes deceived in our microscopic "oceans," and led into error when seeing one of the protozoa making dinner of a defunct micrococci.

We do not want any forms of life, animal or vegetable, in our drinking water. We may know enough concerning them not to have misgivings in regard to the development of those species originating in pure water; that is to say, water uncontaminated with sewage matter, but their presence is always positive evidence that there is pabulum, as well, for others of which we have reason to dread.

The writer disclaims any pretentions to scientific acquirements in chemistry, or microscopical research and their pathological bearings, yet with the highest respect for the learned specialists, who are laboring in these fields, he believes they have not as yet devised any convenient or comprehensive system of standards for determining when the water of our rivers is unfit to drink. The tests for albumen and nitrates, seem of late, to be neglected at least in our local examinations too much for microscopic work, and both the microscopists and the chemists are handicapped by doing all their work in their laboratories with sealed, and unlabelled, specimens of the water. In a neighboring city

there was, recently, an illustration of the imperfection of this blindfolding method, where samples of the river water from opposite the city, were compared with water taken from a point, many miles above, where no sewer exists. It so happened that the water from above the city having been found to contain specimens, we believe of entozoa, was pronounced to be more contaminated than that below. It is clear that the microscopist would never have asserted, without qualification, such a thing had he known how, and where the samples were gathered. The finding of a single objectionable specimen in the presumably purest sample would have suggested to him a more laborious examination of the other sample, and under high powers, for the throough examination of water requires diligent application and protracted labors.

There is needed in the study of the hygienic qualities of river water besides scientific acquirements, practical knowledge of the stream. The facts regarding the width, depth, normal and least velocities, volume of discharge of the river, position of sewers, and the character of their contaminations should all be studied, with their relative bearings before decisive opinions are expressed. The public are sometimes needlessly alarmed by the reports of the specialists, when not thus supplemented by a consideration of all the facts. All this has little to do with the future of our rivers as sources of water supply, but as all know they are continuing to become each year, more and more impure, there is little to be said on the subject save to reiterate the fact.

Regarding the quantity of sewage waters returned to our rivers, Dr. Parkes, years ago estimated the amount of *absolute* sewage it contained to amount to about 1,000 lbs. per annum for each inhabitant. No account, however, being taken of the true sewage which should be apportioned to animals, kitchen waste, slaughter houses, tanneries, etc., and that contributed by the streets. Three thousand pounds per annum, or say nine pounds of absolute sewage per day, for each inhabitant, is nearer the truth. The daily waste of water, approximating one-half of the total supply, the other half lost by evaporation, which would make, say, for Pittsburgh, 115 gallons, is mixed with the nine-pounds, or nine pints of absolute sewage, and in case of rains the dilution would be many times greater. We might pause here to ask is not this a good thing to dilute the sewage? Well that is one of the problems. We know that no quantity of white paint mixed with black will render the latter pure white—and that a very little black will go a long ways in discoloring a large quantity of white paint. It would seem a pity, therefore, to contaminate so much water—and also our streams, simply to get rid of this small quantity of real sewage—and yet, that is what sewers are primarily intended for. If Waring's system of separate conduits for house drainage and storm waters, is not yet a pronounced success, his ideas are, like those of the experimentors with the storage battery system for street car propulsion, in the right track, and

it is to be hoped they will ultimately suceed. It would be a matter within reasonable limits of practicability, with such a system, by chemical means to convert house sewage into useful fertilizers—and to a great extent relieve our streams of the danger of becoming propagators of disease. This may be only "theory" beset with too many mechanical difficulties—as the numerous opponents of the Waring system affirm, but why it may not, some day, become an accomplished fact, the writer has yet to be convinced.

What concerns us now is the devising of means to determine how far we may suffer our rivers to be polluted before abandoning them as direct sources of water supply. We have filter systems proposed, and many advocates for their use already. We cannot diverge to treat upon their merits; although the writer earnestly advocates the use of filtered water always—where the supply is not drawn from a permanently clear source. A sudden local gust of rain often brings into our rivers when low, floods of foul water and mud in sufficient quantity to make the entire stream disagreeably odorous and turbid, charging it with conferva from small ponds and stagnant pools—and with the vegetation, the myriad forms of animal life it supports, and it is probable that the epidemics of diarrhœa, and other summer complaints of children are aggravated, if not sometimes directly chargeable to these apparently insignificant "mud floods in our western rivers."*

Since the clearing, ploughing and cultivation of the country, our rivers are more frequently charged with mud in suspension than before the soil was broken, and it was covered with forests, and thus we have from sources in no way connected with the drainage of cities, an increased responsibility in the care of our rivers as sources of water supply.

Either natural or artificial systems of filtration would free the water of these palpably evident impurities—while the claim is set forth that with proper filtration, nearly all the animalculæ in water may be removed—perhaps they may, and perhaps they may not—it depending on ones sympathies, which way to think. Experience with wells points to the system of natural filtration as being the cheapest and most perfect:—

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*In the latter part of July, 1887, there was a sudden flood in the valley of Little Red Stone Creek, a tributary of the Monongahela, fifty miles above Pittsburgh. The river was quite low at the time. The mill dams, &c., which were swept out of the creek, emptied into the river a bed of conferva, which, in the course of a few days covered the entire river (eight hundred feet wide) and made it vividly green in great patches of hundred of acres in extent, covering nearly the entire river for a distance of three miles. Every specimen observed by the writer exhibited under the microscope, forms of animal life. The entire mass floated regularly with the river current about two miles per day (four hundred and forty feet per hour) but before reaching Pittsburgh, owing to the violence of the wind and other causes, perhaps, it became unrecognizable.

Special examinations are required, of course, to determine for any particular place whether the well, or gallery, *i. e.*, natural system is practicable.

It is safe to take the ground that when, after thorough examination, our rivers are pronounced to be dangerous sources of water supply, it is time to stop the cause of the contamination—and it must come to this, for it never can be agreed that in the future we are to depend on filtering, or doctoring our water to make it ordinarily safe to drink. We may believe, as was shown of the river Vesle in France, which receives the drainage of the city of Rheims, that while that stream was pure above said city, and was foul immediately after passing the place, but gradually, in a few miles, by a natural process of oxygenation, it became pure again, that the same thing will occur on American rivers. It does occur, in every probability, in the case of the Ohio river, which at this place receives the sewerage of 350,000 people, and at Wheeling, 90 miles below, is used without any deleterious effects, something which hardly could be the case unless the germs imparted to the stream here die before reaching Wheeling. The Ohio, with its 20,000 square miles of drainage area here, and 700,000 gallons per minute minimum discharge—or six times that of the Schuylkill at Philadephia is too large to be seriously contaminated, or at least permanently polluted by the sewers of such a city.

Not so, however, of very many other streams—and against the case of the Vesle in France, and the Thames in England—where a partial purification has been observed, there are recorded observations of considerable streams which flow for many miles below cities, and have been pronounced to be permanently polluted.*

As a valuable aid in determining the comparative purity of river waters, the writer attaches great importance to the oxygen test as first thoroughly treated, we believe about fifteen years ago, by M. Geradin, in a paper which received a prize from the Paris Academy, and taken up by Prof. Albert Leeds. The writer had two years ago the privilege of bringing the oxygen test as a question, following the lines laid down by the learned authorities mentioned, before the Society of Engineers of Western Pennsylvania—and sought to show that we had in the observation of the higher forms of fish life, a conclusive criterion perhaps, of the healthfulness of the water; we would certainly condemn as unfit to drink, any freshly drawn sample of water in which a bass, salmon, or trout could not support existence—allowance, of course, being made for temperature, which should be that congenial to the fish.

Prof. Francis C. Phillips, of our Western University, gives for one hundred parts or volumes, of air dissolved in water, oxygen 36 parts, the remainder nitrogen. This is the standard, he says, of pure water

* In such cases the fixed pollutions were probably of inorganic origin and material such as dye stuffs, or other non-putrefiable materials.

exposed to air; the writer can give no figures of the minimum per cent. of oxygen capable of supporting the higher forms of fish life, and these only should be considered, but believes, with an "intuitive faith"—the fortunate privilege of the laymen—that it is high enough to destroy most, if not all, forms of life introduced into it whose habitat was oxygenless sewage waters. Prof. Phillips stated further, in the debate following the paper referred to, that some years ago a fresh water sponge developed in the reservoir supplying the city of Boston—which imparted a peculiar cucumber taste in the water, making it, if not absolutely unsafe, certainly very abominable to drink, and yet it did not appear to affect the fish. We most distinctly disclaim the attempt to apply this test excepting for the detection of such forms of life which can exist and find their pabulum in waters deficient in oxygen. The sponge in the basin at Boston, and at Philadelphia and Rochester, N. Y., as mentioned by Mr. Charles Davis, appears to have produced no injurious effect on the public health.

We must partake of some faith in this theory, for we find organisms, as a rule, graduated in the scale of existence by the character of the media in which they exist. The fish in some of our streams have disappeared, it is supposed from "over fishing," when very likely, they have deserted the stream because of pollutions which would have asphyxiated them had they remained. Streams, therefore, or parts of streams, which cannot be re-stocked with game fish of varieties that formerly inhabited them—should, in the writers opinion, be avoided by the hydraulic engineer, who is called upon to locate sites for waterworks.

The PRESIDENT. As the next paper is on the same subject, I wish to call for the reading of that paper before asking for remarks. I now introduce to you Prof. Henry Leffman of Philadelphia, who will deliver a paper on the Selection and Treatment of Public Water Supplies.

THE SELECTION AND TREATMENT OF PUBLIC WATER SUPPLIES.

By HENRY LEFFMAN, M. D.

In most parts of the earth the inhabitants of sparsely settled districts find no difficulty in securing an abundant supply of wholesome water.

Natural springs and surface waters undisturbed by human action, conform in almost all cases to the highest sanitary standards, and the subsoil water is also generally satisfactory. The selection and treatment of water for drinking purposes becomes a problem of the highest practical importance, and of much scientific difficulty when a populated district is under consideration. Not only does the absolute pollution of all water sources largely increase, but the natural regenerative or purifying processes are hampered and interrupted.

Medical authorities are now generally agree that a favorable influence of the system both in health and disease is produced by the free use of water and it is not unlikely from clinical experience and physiological inference that all other forms of liquids especially stimulants of various kind are less beneficial than pure water. The suspicion that water may be the vehicle by which injurious materials may enter the body has been amply confirmed by recorded instances, and it has therefore become one of the most practical and urgent of sientific problems to determine by analysis, the suitability of water for drinking purposes.

The solving of this problem has, however, been delayed by the fact that even up to the present moment no positive information is at hand as to the exact manner in which disease may be conveyed by water, that is as to the particular chemical or mechanical conditions which determine the action. It will not be necessary to review here the various theories which have been proposed or the methods which have been based on them. It will suffice to indicate broadly the general tendency.

As soon as we begin to examine the chemistry of natural waters, we find there are several frequently occurring ingredients which have but little sanitary significance, except when present in excessive amounts and then the taste or other properties of the water renders it practically non-potable. Such ingredients are compounds of magnesium, iron or sulphur, or bodies that make the water distinctly alkaline or acid. Waters of this type possess often special physiological properties, which render them suitable for therapeutic uses, but those need not concern us here; other ingredients when present in even very minute amounts exercise a deleterious action, generally of an insidious character. Among this class may be mentioned lead and arsenic compounds. A third class are those which confer no striking property on the water and are of little moment when present in minute amount, but when in considerable quantity become injurious. Vegetable organic matter may be cited as an example of this class. In recent years, a fourth class of ingredients has been brought into notice, and has indeed become one of the most important points for consideration. Including those bodies which are, the residues or final results of action of natural or artificial conditions to which the water is subjected and which while of but minor influence in themselves furnish a clue to the history of the water.

A proper appreciation of this topic will necessitate some knowledge of the different classes of natural waters. We may conveniently distinguish four types.

Rain water: under which is included all water deposited from the atmosphere, hence rain, hail, snow, dew, or frost

Surface water: All collections of water in free contact with the air, rivers, lakes, seas.

Sub-soil water: Water at moderate depth below the surface not in

free contact with the atmosphere and derived in large part from the rain or surface water of the district.

Deep Water: Water accumulated at considerable depth below the surface and from which the sub-soil water of the district is excluded by difficultly permeable strata.

It is obvious that the standards of purity for these different classes will be different. From a theoretical point of view, rain water should be the purest form of all, but practically this is by no means always the case. When collected in uninhabited places and after much rain has fallen it contains but little foreign matter, but it is never perfectly pure, and when collected in cities it is always quite impure. Few persons have any idea of the amount of water that falls during a rain. An inch of rainfall is equivalent to one hundred tons of water on each acre. No doubt when districts become more densely populated and engineering operations are conducted upon, even a larger scale than at present, means will be devised for collecting and storing much of the rainfall, in such a manner as to secure a safe and abundant supply, but at the present time the collection of it has very little to recommend it to the sanitarian.

Water for instance, drained from roofs, and collected in cisterns is of uncertain quality, and as will be seen further on may be decidedly unsafe.

In establishing standards of purity for water supply, we must keep constantly in view the type to which the water belongs. A rain water containing three grains of solid matter to the gallon would be impure, while a similar proportion in a well water would be a favorable sign. Similarly, certain nitrogen derivatives, ammonia and nitrates might be present in considerable amounts in well water without invoking suspicion, while in a river or other surface water they would be highly suspicious. Unfortunately the data for deciding upon such points, are but imperfectly known. Processes of analysis have undergone so much improvement in the last few years that it is not possible to compare analytical results obtained years ago with those now obtained.

A brief history of the course of a given mass of water will serve to show the varying significance that may be attached to the same ingredients according to the circumstances under which the water is collected. Rain in falling through the atmosphere will absorb the different gases, particularly any ammonia or carbon dioxide, both of which are always present, and will also carry down mechanically numerous particles living and dead. Falling on the surface of the ground it will partly run off and partly sink into any porous rock or soil. That which runs off will take up more or less material and gradually gather into streams and rivers, constituting surface water. The exposure to light and air which such water undergoes facilitates chemical changes of an oxidizing character, and the organic matter is gradually destroyed Surface

water is often turbid, but as rivers approach the sea, much of this turbidity is deposited. The water which sinks into the soil takes up various substances, and changes also begin in the organic matters. Recent researches have established the fact that these changes are absolutely dependent on micro-organisms. The action consists essentially in the breaking down of the complex organic products, the remains of the tissues of animals and plants, and finally the formation of ammonium compounds; these latter are then by the action of special microbes converted into oxidized forms, known as nitrates and nitrites, being compounds referable to nitric and nitrous acids respectively.

Nitrates are the final step in these changes and their presence in water to the exclusion of any other form of combined nitrogen would be evidence of the completion of the destructive and purifying action of the soil. It is rare however to find such complete oxidation, and generally three and sometimes four classes of nitrogenous compounds are found in these sub-soil waters.

These are unchanged organic matter, ammonium compounds, nitrates and nitrites. Except in places near the sea, or in the vicinity of salt deposits, the sub-soil does not contain large amounts of soluble chlorides, and it is found that typical sub-soil waters contain but small amounts of chlorine. When, however, animal excretion or refuse gets into soil, chlorides are always present, and hence the determination of the amount of chlorine in sub-soil water has long been an important analytical point. For the same reason the proportion of chlorine in rain or sub-soil water should be low.

When, however, water passes to considerable depths, its solvent powers become much increased by the increased pressure and temperature, and it encounters strata containing mineral substances from those in the sub-soil. Such water may find its way to the surface through natural or artificial borings. Of the former, the mineral springs, thousands of instances are known, scattered over all parts of the world and exhibiting great variety of composition. The artificial sources constitute the artesian waters, and these also are very variable in character. Their depth is much less than that of most of the true mineral springs. The constancy of composition of these deep springs is remarkable. The Bedford Magnesia spring was examined in 1878 by Dr. Genth, and again examined by myself in 1888, and was found to have undergone but little change in its complex composition, although vast amounts of water have flowed out of it in the interval. A large proportion of mineral solids with comparatively little organic contamination is the general feature of deep waters. Unfortunately the mineral solids are often so decided in their physiological action as to render the water unsuitable for drinking purposes, but when such is not the case, this class of waters constitutes an excellent source. From a geological point of view

these sources are also interesting, some of them representing the ocean waters of past ages.

A deep water it must be noted is not merely a water taken from a considerable distance below the surface. The term is only properly applied to those underground currents or collections which are separated from the surface and sub-soil waters of the district by substantially impervious strata. The fact, that mere depth is not the feature was very well shown by some analysis made by my assistant, Mr. Beam, and myself, of the water from two wells, one at Barren Hill near Philadelphia, one hundred and thirty feet deep, a dug well deriving its supply from the surrounding sub-soil and quite impure both in organic and mineral matter, and the other an Artesian boring one hundred and twenty-eight feet deep, near Baltimore, which furnishes a very pure water. The latter, however, passes through four feet of solid rock, which doubtless cuts off all connection with the sub-soil water. The uncertainty of the character of artesian waters will constitute a serious difficulty in employing them as regular methods of securing public supplies in Philadelphia for instance, where the high water rates have led to considerable resort to this method, great differences in quality are noted even within limited areas. Thus, of two deep wells located in the centre of Philadelphia, but a few hundred yards apart, one contained considerable iron and no manganese, the other considerable manganese but no iron.

Within the last few years much attention has been paid to the examination of the organic life in water, and much interesting and practically valuable knowledge has been gained. The microscopic examination of ordinary water sediments has long been a favorite field, but the results have been of but little sanitary value. It is true that the presence of the higher forms of animal and vegetable life is generally noted in rather good waters, but the inferences will be uncertain. The class of investigations which are more satisfactory are those in which the minute microscopic organisms grouped under the general title "microbes," are determined. Great benefit has been derived in these observations by employing the ingenious culture methods. The examination of a sample directly by means of the microscope would be an extremely difficult task, and is rarely resorted too. The usual plan is to mix a known volume of the water with a sterilized nutritive fluid and spread the mixture over a glass plate, which is then placed under conditions favorable to the growth of any microbes that may be present. Each organism then becomes the centre of colony of its own kind, and the determination of the number of colonies and of their specific character becomes easy.

A very large number of most careful and painstaking experiments have been made in this manner. The method is primarily due to Dr. Koch, and many of his pupils, as well as those of the other laboratories,

have contributed results. Dr. Percy Frankland, of England, has done much work of the kind. It does not appear that from the results of the method an absolute judgment of the sanitary value of a water can be made. The micro-organisms are subject to great variation in number without corresponding variation in the sanitary significance. Transportation and storage have considerable influence, and tests are of little value unless made very soon after the collection of samples, a point that will be rarely practicable. Although the expectations of analytical results have not been realized, much information of value in sanitary engineering has been obtained. The effects of storage, transportation, and especially of filtration of water have been clearly indicated. Applied to these problems, the method seems free from serious fallacy. By it we have learned that the storage of water in reservoirs has a beneficial effect on its wholesomeness, that even disease producing microbes may be ultimately exterminated through the process of natural selection, being overcome by the microbes normal to the water and therefore better fitted for the struggle. The result is however not always obtained, some of the more virulent microbes having high resisting power.

The general chemical and biological principles which have thus been hastily sketched may be applied to the problem of judging of the suitability of any given supply. So far as the proportion of dissolved solids is concerned we cannot assign any close limits. Statements are made by some authorities that pure water is unsuitable for continued use, but there does not appear to be any sound theoretical reason for this view, nor is it confirmed by experience; similarly the upper limit of solid matter is uncertain. Sea water is non-potable, and sanitary authorities have assiged an arbitrary limit of forty grains to the gallon but there are waters in constant use which exceed this figure. The artesian well at Black's island, Delaware county, Pa., contains about eighty grains to the gallon, is of pleasant taste and has been used for a long while without apparent injury by a considerable number of persons. The attempt to judge of the wholesomeness of water by its general properties such as color, taste and smell cannot be considered satisfactory. It is true that an absolutely pure sample will be clear, colorless, odorless and almost tasteless, but many good waters are known in which there is distinct color, and on the other hand samples of the most dangerous description may not show any of this to the senses. In the populated districts, the sub-soil waters as obtained in wells are often clear, cool and very refreshing, but plenty of evidence is at hand to show the danger of such supplies.

It has been noted above that observation as to the changes in water in its various experiences, modify considerably its standard of purity. Chemical examination at the present day is concerned largely with determining how far the condition of a sample indicates a previous asso-

ciation with polluting materials. Among the important points in this regard are the various states in which the nitrogen is found, and the amount of each of the four classes of compounds in which it occurs. It is particularly the nitrates representing an intermediate state of oxidation due either to insufficiency of purifying influences or to recent contamination with fresh pollution that are regarded as most objectionable; in fact, if chemists were to be limited to one test for water, the extremely delicate reaction for nitrites which we now have would probably be preferred. By this, one part of a nitrite can be detected in 100,000,000 parts of water which is one grain in 17,000 gallons. Chlorine also as being generally associated with sewage is a suspicious ingredient. It is quite important to note that these substances are not injurious in themselves but are merely indexes of previous contamination.

All considerations go to show that one of the most important points in judging of the safety of a water supply is information as to the probable origin of the water, of the opportunities of contamination to which this lies liable. In most cases, indeed, the selection of a supply will be an engineering problem to which, however, chemistry may lend much aid. This fact is often neglected, and it is often difficult to obtain the proper data as to source and surroundings from which samples were taken.

While it is true that not much is known as to the value of the mineral ingredients found in water, there is one relation in which it becomes of moment. Water is very frequently distributed in lead pipes, and is liable to take up some of this metal and become highly poisonous. Recent observations have indicated that lead is probably one of the most insidious foe to health to which civilized communities are exposed. As the methods of distinguishing lead poison become more and more clearly known, the defective cases become more numerous, and it would seem that it forms a notable item in the mortality lists. There can be no more insidious method of its introduction into the system than through drinking water, and even minute amounts are sufficient to ultimately cause trouble. For this reason chemists have paid much attention to the conditions under which water takes up lead, but unfortunately the matter cannot yet be considered as settled. For many years it has taught that the sulphates were the protecting influence, that they precipitated the lead, in an insoluble form. This view has, however, been exploded, and more recently the view has been accepted that the silicates are most efficient. Free acid, chlorides in considerable amount and sulphates are now considered as promoting this corrosion, while carbonates, phosphates and silicates, are considered as diminishing it. It appears that water otherwise objectionable, especially those containing but small amounts of solid matter, may be the source of serious injury by reason of their action on lead. This is a point rarely noted in sanitary reports.

The danger of action on lead finds an application in the judging of the use of rain water. This is, as is well known, quite soft, that is, contains but little mineral matter. It is also thoroughly ———— and may contain ———— and sulphates both of which promote corrosion. Hence the ease with which, if lead lined tanks should be used for storage or lead pipes for distribution, the poisonous metal could be taken up.

Water of typical purity, corresponding to the narrow standards laid down cannot always be obtained, and already existing sources of supply have by the movements of trade or population become deteriorated. It becomes then an important question, as to what may be done to remedy the difficulty. On this point, Chemistry and Bacteriology, particularly the latter, give us much information.

Speaking generally, the substances in water may be either in solution or suspension, and the objectionable ingredients may be in either or both the classes. While we are yet ignorant of the exact character of disease-producing agencies, yet it is well understood that they are destroyed by a brief exposure to a temperature of 212 F. Simple boiling of a sample of water for a moment, will be sufficient to kill any living germs which may be present; such a method is only applicable on the small scale. For some time, the tendency has been to assume that the capacity of water to convey specific diseases depended on living micro-organisms; a natural inference from this was, that any method which would separate these would render the water harmless. Experiments have shown that even the subsidence of fine particles through the water, will remove a very large proportion of the microbes, and certain chemical coagulants have the same power. A turbid water may be rapidly and satisfactorily improved by the use of alum in the proportion of about two grains to a gallon. This method like that of boiling is not so suited to use on a large scale except by special contrivances, but a well known process of filtration involves the use of this plan. As a household remedy, in cases in which turbid water supply occurs the alum method is quite suitable.

Filtration is of course, the most obvious and the most convenient method of purifying water. Observation has, however, shown that it is not merely so efficient as it might be supposed.

In judging of the efficiency of filters it must not be forgotten that the most recent investigations into the causation of disease, tend to give considerable weight to the chemical products of organic decay and microbic action, so that even after all solid suspended particles are removed, these dissolved products may be present and active. An absolutely clear water, therefore, may be dangerous.

Dr. Plagge, of the Hygiene Institute of Boston, made a number of careful tests of filters with the following results: "Carbon filters not only permitted the free transmission of micro-organisms, but in some

cases the number of these in the filtrate greatly exceeded that in the unfiltered water. In one case, the unfiltered water yielded 68 colonies per c. c.; the filtered 1,200. Frankland also found a similar result, and as he remarks, the filtering medium obviously acts as a hot-bed for the development of the micro-organisms.

The stone and sand filters were all found to be worthless.

The spongy iron filter yielded the following results: The unfiltered water yielded 34,000 colonies per c. c.; the filtered water, 18,000 to 24,000.

The paper filters yielded very unsatisfactory results.

The earthenware filters on Pasteur's principle gave, in nearly every instance, a filtrate practically free from micro-organisms. Thus in one case the unfiltred water yielded 284, and the filtred only 4 colonies per c. c. The abestos filters gave results essentially similar to those obtained with the earthenware filters.

The advantage of earthenware and abestos filters is, that they will bear treatment with boiling water, or the application of dry heat, by which any organic life which may penetrate the pores or lodge closely on the surface, can be destroyed.

For the purification of drinking water on the large scale, sand filter beds have been found to be more efficient; but good results are obtained only under proper supervision and attention to cleanliness and renewal of the filtering material.

By the addition of a ferric salt, the water is attended with the same decomposition and formation of a precipitate as with alum, and the reaction has been utilized with great advantage in the purification of water. One of the methods proposed was by treating the water with spongy iron, by which a certain amount of the iron is dissolved and is subsequently removed by passing the water through sand filter beds. It was found, however, that the iron soon lost its activity, by reason of the formation of rust, which prevents further action. This difficulty is removed by the use of granular iron contained in an iron cylinder (Anderson & Ogsten, Proc. Inst. Civ. Eng., vol. 81), which is rotated while the water passes through it; the iron is brought into thorough contact with the water, and there is sufficient abrasion to keep its surface clean. The time of contact with the iron, of course depends upon the relative impurity of the water. For Antwerp water, which is purified by this means, the maximum effect is accomplished in 35 minutes. After leaving the cylinder, the water is passed through sand filter beds in which the iron is oxidized and removed. Examination of the purified water shows it to be practically sterilized, and the quantity of nitrogen obtainable by potassium permanganate is reduced to from one-half to one-third the amount which the water originally contained.

Powdered coke appears to be an efficient filtering material and its efficacy appears to be due to the presence of metalic iron.

A most important point in connection with public water supply is that of storage capacity. From all points of view this is an essential and yet it is often overlooked. The storage of water improves it, not only by the opportunities it gives for subsidence, but the transformations that are produced in the bacterial life. While little can be learned by a single examination of the water, much can be discovered by frequently repeated and regular examinations, and it is possible for such examinations to be carried out by any person of reasonable intelligence. When therefore, a community decides on the general availability of a given supply of water the first endeavor should be to secure such control of the territory likely to affect that supply, that will prevent absolutely a deterioration from preventable causes. Next, ample storage capacity should be secured, not only that the community may be saved from the serious results of an accidental failure of the supply, but that, if it is inherently variable in quality, or unavoidably deteriorated, an intermittent use of it may be practical, that is to say, the water stored while it is in good condition and this stock used as long as the supply is defective. History, we are told by a great authority, is philosophy teaching by example, and we may find ample proof of it in sanitary history. The condition of the water supply of the city of Philadelphia, is a case in point. The Schuylkill Navigation Company, a nearly moribund corporation so far as any business activity is concerned, have the first right to the water of the Schuylkill river, and some years ago during a summer drouth, actually asserted its right, and compelled the city to pay a large sum for taking the water in quantity sufficient to interfere with the company's business. Then the river is subject to turbid freshets, and is often decidely inferior in quality, but is also often very satisfactory. The storage capacity at command has not kept pace with the increased population, hence the water has to be used directly from the river. Such a city, it seems to me, ought to have reservoir capacity for not less than 30 days' supply, the reservoirs being so arranged no water need be used that has not been undergoing at least 10 days' subsidence. By a proper engineering construction and analytical control, water could be pumped into the empty sections of the reservoir while it was in good condition, and as soon as turbidity or marked impurity occurred, the flow into the reservoirs could be stopped and the stored water resorted to until the condition of the supply again improves. Ample storage capacity is also an advantage in the employment of any filtration system, or in the use of any process of chemical treatment. Much opposition would probably be occasioned by the introduction of any system of chemical precipitation, but I do not think there would be any scientific objection to it in cases in which other means were not at hand.

The effects of aeration of water have been spoken of favorably by home writers, but there does not seem to be any substantial advantage

in the mere introduction of air itself, by machinery into the flowing or standing waters. It has been observed in several cases that when the proportion of dissolved oxygen becomes very low, peculiar vegetable organisms begin to develop, but nothing definite is known as to the effect of such. Carbonic acid has undoubtedly a marked inhibitory influence on the micro-organisms, and contributes also an agreeable taste to water.

Summing up then, these considerations we may say that rain water although theoretically the most pure and abundant, is practically unavailable and often unsafe. Sub-soil and surface offer the most agreeable and uniform source, but require careful protection and constant analytical control to prevent insidious disease producing action. The most unexpectionable sources from a sanitary point of view, will be the true deep waters representing, as they do, masses of water that have passed through an enormous distance of soil and have long since lost any contamination, but their practicable value is reduced by the fact that their mineral constituents are often objectionable.

We find also, that chemists do not yet know what are the actually dangerous bodies in water, although some progress has very recently been made in identifying special bacilli. The basis for judgment is generally the detection and estimation of such ingredients as throw suspicion on the past history of the water.

We note further, that for the protection and improvement of a city supply there is needed ample legal control of the gathering ground, abundant storage capacity, with sectional reservoirs for a systematic parcelling out of the water, and filtering attachments of simple character, and easily accessible chemical purifications may be secured, if the conditions renders it necessary.

Though not directly connected with the chemical or engineering features of the question, I feel impelled to observe in closing, that I think that the furnishing of public water supplies, is one essentially a matter of official control. It is the most valuable franchise that can be possessed, and should not be passed to hands of private parties or companies.

Under an enlightened and scientific management of the question, it will be possible to furnish to all an abundant supply of that beverage which far excells all others in wholesomeness, pure cold water.

The PRESIDENT. The subject of the two papers is now before you for discussion. We will be glad to hear from any gentleman present on the subject.

Dr. THOMAS HUBBARD. In view of the chemical tests which have been spoken of, both in reference to water and in reference to the examination of air, one cannot help but be struck with the fact that chemistry acknowledges a deficiency. In other words, carbonic acid gas in the examination of air is only taken as an index of impurity, and in the

light of modern chemistry is not regarded as the deleterious element itself.

In the same light the nitrites, as spoken of by Mr. Roberts, are regarded as an index of organic impurities, an index of an amount of actual deleterious elements which may exist in the water. Hence we cannot but fall back on what may be called the purely practical test, *i. e.* observing nature. I think the oxygen test, as spoken of by Dr. Wilson, is perhaps one of great importance. Where the fish that have been passing through a stream have been noticed to dissappear from it, it is evident that there have been decidedly deleterious agents poured into that water.

In the light of this fact, I fail to see why the gentlemen have made the statement that long storage increases the purity of the water. Certainly there is always present a certain number of micro-organisms which permit of oxidation at various times, and of course with it that consumption of the oxygen which is naturally in the water. The result of this is, as stated, that certain very low forms of vegetable life appear in the water. The only kind of water that I can see that would benefit it by the prolonged storage that he has recommended, is water that requires sedimentation———in which there is a heavy sediment and by means of storage the sediment disappears from it.

Dr. LEE. Mr. Chairman, reference was made in one of the papers which was read to the water supply of Philadelphia. I will state that since arriving in Pittsburgh, I have received a communication from the health officer of Philadelphia, stating that he understands that certain systems of storage and filtration are under trial here in Pittsburgh, and that he is very desirous indeed, of obtaining all the information possible from those who are investigating the subject here.

This is only another evidence of the fact, to which I alluded this morning, that Pittsburgh seems to be taking the advance in all sanitary movements, and that the whole State is looking to her for a solution of the difficult problem with which they are now presented, as regards the water supply, and other questions of sanitation.

I should be very much indebted if any Pittsburgh gentlemen who are familiar with what is now being done would enlighten the convention on that subject.

Mr. T. P. ROBERTS. Mr. Chairman: I think Mr. Superintendent Armstrong, or any member of the Allegheny City Councils could give you the information. But in regard to the filtering system in Pittsburgh, or rather in Allegheny, there have been some experiments made with a system of filtration, by an attachment made to one of the main pipes supplying a portion of the city to the extent of about, if I recollect right, of 300,000 gallons a day, whether it was attached to that extent or not I don't know; but I understand the experiments have not been very satisfactory, so far as I have heard. I should not really speak of it,

except that there is no person here having knowledge of the subject (so far as I can see) so I am probably very bold in making the statement.

It was a system known as "The Ohio System of Filtering," with the use of alum as a precipitant—two grains of alum to a gallon of water. It is in the experimental stages as yet.

The PRESIDENT. I now call upon Dr. Wm. B. Atkinson, to read a paper upon the Proper mode of Conducting Sanitary Inspections.

THE PROPER MODE OF CONDUCTING SANITARY INSPECTIONS.

By WILLIAM B. ATKINSON, M. D.

Ladies and Gentlemen: When I was requested by the Secretary of our Board to prepare something in the shape of a paper for this conference, I was not aware that there would be so much valuable matter offered for your consideration, and, had I known it, I should certainly have insisted that he allow me to decline offering anything before you.

I have been so much loaded down with work within the last few weeks that I have been unable to do more than make a few notes of what I wished to read before you; and therefore, you will understand that this is more in the light of what I would deliver as a lecture to my class, than as a finished paper which I would offer to a scientific audience.

In making an inspection, of whatever kind, it becomes of importance that the inspector should have in advance, some idea of how he is to proceed. For this reason I propose very briefly, to offer a formulation of my views of the proper mode of making an inspection, that it may save time and render more surely the best results from such work. We are often furnished with a very vague idea as to the trouble complained of, and are compelled to look up our data from a variety of circumstances.

In inspecting a nuisance, it is proper to learn from the complainants exactly what is the subject of the complaint. Many people make objections to certain places, but when closely pressed, are entirely unable to give any ground for such objection. Perhaps one of the wisest rules adopted by the Board was that requiring that no complaint should be received, unless from an official source, or backed by the affidavit of a proper number of citizens. Before this it was so easy to "put the Board of Health on" an enemy, that complaints were constantly made without foundation, thus annoying worthy persons and creating unnecessary expense to the Board.

Learn from those living in the vicinity, what effect the nuisance, so called, has upon them, and the more of these opinions there are obtained the better, as in some instances the statements obtained differ

very materially, and often a valuable clue is secured from an unexpected source.

I was asked to go up into a locality which was dotted all over with most lovely houses; the population was composed of people who had been engaged in making money so fast, that they had not had time to attend to their health, and they had now built themselves beautiful homes in the open air of the neighboring country, near to Philadelphia, with the idea of regaining what they had lost in the race for wealth.

I was informed that in a certain hollow there was a piggery, which was a source of great offense to everybody, and I thought, as I had the opportunity offered me, by one of the gentlemen who had complained, of riding around the country a little, I would do so. I went the radius of, I think, fully a mile and I had an opportunity of hearing from people most unexpected statements. For instance, I went into see one old lady, who said, "I have nothing to complain of, sir; the piggery does not annoy me one bit; he is a good inoffensive man; he is a neighbor of mine and I wouldn't do him any harm." I said, "Madam, I am not here for that purpose. I do not intend to do the man any harm. But do you think the odor from that piggery is at all annoying to you?" She looked at me a moment, parleyed a good bit, shut the door and said, "If you won't say anything about it, it make me sick so often that I am unable to eat my food when they are feeding those pigs."

Again, but a short distance from that place, we visited a lady who was then in the incipient stage of Phthisis. She had been compelled to abandon out-door exercise, which she had gone to the country to obtain, simply because this man was engaged in feeding his pigs three times a day from slop, which had been allowed to accumulate at a neighboring large hotel until fermentation had taken place. And I have no doubt, in the least, but what her subsequent death was hastened by this contamination of the air. I went from house to house; I suppose I must, on that occasion, have visited some twenty or thirty families. Some of their statements were equal to that of the old lady, who said she didn't find it offensive in the least, until they found they were talking to a person who did not intend to disclose what they said, and then they came out with the truth of the matter.

A Pig-pen Inspection. In inspecting a pig-pen I have always felt, first, that it was necessary to know what a good pig-pen should be. That subject was brought very forcibly to the attention of this Board by the summons of Dr. Lee, our Secretary, and myself, before a court in Norristown, where we were asked what a pig-pen should be, to be in a good condition.

One of the lawyers jocosely said, "Well, sir, you want to have this pig-pen a gilt edged pig-pen, the floor covered with marble, or with walnut, the sides papered with gilt edged paper- in fact you would like to have a carpeted floor, if not a rag carpet, certainly something of the

kind?" My reply was, that a pig-pen in proper condition would be one where a pig could live without injury to his health, or to the health of anybody around him. The lawyer took me up there and said, "Well, in that case do you mean to say a person who lived in the vicinity could be injured by a pig-pen which was in bad condition?" "I certainly would." He bade his client stand up: "What do you think of the man himself personally?" "He looks like a healthy man." That man, (I knew it) had lived in the middle of his pig-pen, had lived there, slept on the board floor covered with straw and his pigs all around him, so that at any moment he could have reached out and almost touched a pig on any side. The lawyer brought that up as an example of the fact, that a pig-pen could not be injurious to a person who would live in the middle of it.

I should estimate, (if I could not count positively, the number of pigs, their size and general condition, the location of the pen, the size of the pen, the presence or absence of filth beneath the floor, and the opportunity by which any filth that was deposited upon that floor could obtain access below, and whether it was arranged in such way that it could be cleaned out at proper intervals; the locality of the house, the locality of the well from which drinking water was obtained for the use of the house, the relation of said pig-pen to neighbors.

To be in a proper sanitary condition, a pig-pen, cannot be otherwise than properly floored. A pig pen which is nothing more than an inclosure to keep the pigs from straying around the locality at their own will, certainly cannot be a healthy pen, so long as they have the ability to trample down their food, and their excrement, indiscriminately into the soil upon which they lie, and where they are confined the greater portion of their time.

A slaughter house in all cases should never be regarded as in a healthful condition, or in proper sanitary condition, without a cement floor. This point came up on a certain occasion when a gentleman said to me, "Do you see those rats running in every direction." I noticed the rats fleeing as we approached this or that portion of the slaughter house, dragging away with them yards upon yards of offal. "I would give anything if I could get rid of the presence of those rats," said my friend. My reply was, "A cement floor will rid you of the rats forever."

I had an unexpected opportunity a few years ago of testing that. The Deaf Mute Asylum, opposite my own residence in Philadelphia, was so infested by rats that they were a nuisance to the neighborhood, my house probably being the nearest, was continually devastated by them. I had adopted all sorts of plans to get rid of the nuisance. When the new building was erected the whole floor was covered with cement. It was stated by the gentleman who proposed and who urged this, that rats would not live where there was a cement floor. Since then the rat is almost an unknown animal in that locality, and certainly

has disappeared from the Asylum itself. From my house we would see them in the dusk of a summer evening going across the streets in hordes as if they were foraging for supplies.

The bone house connected with the slaughter house, should be properly ventilated; the offal pit should be capable of being kept in the best condition. I have visited before now a slaughter house where the odor was abominable, and it was almost impossible to find out what was the cause of that odor until I demanded that every door should be thrown open, and finally a door which was locked, in some obscure corner, was opened and there the hide pit (in which the hides were kept and salted down), was found in most fearful condition.

I would say to all who make an inspection for this Board, or for any other purpose, that they must be content with nothing short of the most positive searching investigation of every corner.

A slaughter house should be sufficiently removed from a built up neighborhood. This would seem to go without saying, and yet, I visited a city a few miles from Philadelphia where I saw a slaughter house occupying the prettiest portion of the town. Coupling that with the fact that on every side dead cats, dead dogs, dead hogs, everything dead was hauled aside and pushed behind the bushes, could you expect otherwise than that typhoid fever would decimate the neighborhood. That was the cause of my visit to that locality.

The slaughter house should be kept in a condition which would be positively clean, without the adjunct of a pig pen; and the offal, hides etc., should not be permitted to accumulate. One of the wisest and one of the best things done by this Board has been the rule which they have adopted saying that no pig pen should be an adjunct of a slaughter house. I have gone to place after place where I have been informed, that is not my pig-pen; but the pen was so situated that it was the easiest thing in the world to throw offal over the fence separating the property from the property of a neighbor, for which a certain recompence was paid.

All efforts at burning offal, as in some cases is done, should be performed in such a way as to prevent any possible contamination of the surrounding air. At one time it was thought that by elevating the chimneys of the so called crematories that no contamination of the air would result, but it was found that this instead of relieving the trouble only intensified it.

Upon this subject I might say that in a number of instances I have examined the efforts made to carry down these matters and compel them to be burned in fires which carry on the work of the building. In these instances it has always been a failure and produced only the worst possible results.

Thus in a bone boiling establishment all the things obtain to which I have just alluded. The vats in which the frying out of the grease is done, should be covered.

Let me give you an illustration of that. I visited a village in Bucks county some time ago, and I found located on the hill just beyond the built up portion of the village a bone boiling establishment so filthy that it was several days before I could get rid of the odor of it. In fact, it was so bad that the old gentleman who kept the hotel of the village, when I came back said to me, "Well, you found a pretty dirty place?" "Yes, sir, I found a very dirty place." "Yes, when these men come down to my house and sit of an evening in here all the rest of the men goes out." And I don't wonder they went out because it was the most filthy place I think I ever visited.

There were no floors in any portion of the building; there were open vats from which the steam of the boiling carrion was wafted as the air went from side to side. Two large New-foundland dogs were busy in dragging the offal around. Here and there you would see a boy busy breaking up bones of partially decayed carrion that should have been placed in some other place to have been destroyed, and been thoroughly disinfected. In this case no effort of any kind whatever had been made to disinfect the premises.

The inspection of a locality suffering from an epidemic of whatever kind should include every probably source of contagion or infection. Each case should be visited if possible, and great care is needed that a careless diagnosis may not give rise to alarm by reason of an epidemic which exists only in the imagination of the doctors. I will mention to you what occurred to me in a neighboring beautiful county of this State.

I was told there was an epidemic of typhoid fever.

By the kindness of a friend I was driven some twenty-one or twenty-two miles along a series of little country villages, dotting one of the most beautiful countries I think I ever visited. Here and there I was told were five, six, seven, or eight cases of typhoid fever. One house contained ten people, eight of them down with the so-called typhoid fever. To my non-medical audience I may say that typhoid fever, occurring from specific germ, has an inflammation of a portion of the intestine of such a nature that for many days, even weeks, after convalescence, solid food is not allowed to be partaken of.

In one instance where a woman was just at the commencement of convalescence, I was accorded the privilege of inspecting the case. I found her eating for her dinner one large roasted sweet potato, a large piece of beefsteak (about the size of my hand which you can see is not a small one), and a quarter section of apple pie. I thought for typhoid fever it was about the most charming diet conducive to death, I could possibly think of. The next village had some seven or eight cases or more of typhoid fever. I had in each case—that is a point I wish to bring to your notice—asked the physician his opinion of the case, and in every instance it was typhoid fever; I thought in one instance I

would find out something further. "Doctor what is your treatment of these cases of typhoid fever?" "My treatment, sir, is "so and so" and by that means I generally break them up in the course of two or three days after they commence."

To those of my audience who are medical men it will be seen how little the gentleman understood what he was talking about. In this instance where these eight people out of ten were sick of the so called typhoid fever, those who are medically posted will readily see that it was not typhoid fever at all.

The whole cause of the trouble came from a well which was located directly alongside of a hen house. The hen house had half of its roof off and the hens judiciously roosted on the side next to the pump, to get out of the way of the wet, and their excreta, and the debris of all kinds in that hen house were located as close to the well as possible. Every time a heavy storm came this matter would be washed into the well, and the good people of that house drank the contents. No wonder they had dysentery.

Again in one little hamlet consisting of probably eight or ten houses, of very inferior, cheap build, every house had its pump, but one central pump was the pump that was preferred by the inhabitants, to be used to obtain water for drinking and culinary purposes, and that pump was selected because, as a woman very cheerfully remarked, "Well, sir, I always go down there to get water because I can have a chat with the rest of the neighbors, and we hear how things are going." She came from the extreme end of the little village where her pump was free from any source of contamination.

This central pump from which they all obtained their water, received the drainage of at least six cess pools, two stables and a variety of manure heaps and similar accumulations of foul matter.

In an epidemic we need to note the amount of crowding in the houses, their cleanliness and ventilation, the presence of imported members, and the like.

As to the crowding. I found in a house on the west bank of the Schuylkill a population in one ordinary dwelling, that amounted to over 80 people; the majority of them Poles or Hungarians, or of that class. They were working at a neighboring foundry. They were piled in in such a way that it was marvellous how they could sleep at all.

I found at another house in that neighborhood, there were two sets of boarders, one set got out of bed at the time the other set followed them in, and you can fancy the condition of those beds which had thus been left for the new-comers.

Where the cause is not patent we must carefully examine the cess pools, the water supply, the manure heaps, or other filth accumulations, and above all the cellars, which in some instances have been employed as storehouses for vegetables, and have been steadily giving off the deadly miasm.

In one instance, where a case of the most virulent type of diphtheria had occurred, the examiner scented an odor in the house. He asked, "Where do you store your vegetables?" "Oh, doctor, we store them right down here." And turning around, a trap-door was raised, and he went down with the man of the house, taking a light. He said the odor from the decaying vegetables in that cellar, was such that he could scarcely get his breath.

No wonder a virulent form of diphtheria occurred there; and no wonder also, that the moment access was had to the open air, by cutting away the pile of earth that had been made for the purpose of protecting these vegetables from the air, the disease vanished, and the house again became healthy.

The inspection of a water supply should include the original source of the water itself, the spring, stream or reservoir, on account of the possibility of fouling by sewage, manufactories, manure heaps, house drainage, overflow in case of unusual rains, etc. It will take too much of your time to go into the detail of this as I would like to. If I had time to draw from the supply of illustrations which I have continually occurring to me, it would be marvelous to you.

Let me give one little illustration. A pretty village in Chester county, a healthy village, with a magnificent supply of most excellent water, which has its source in a little stream above.

Right on the bank at the place where this water pours into the reservoir, are four houses inhabited by very filthy people, and at any moment a case of typhoid fever might occur in one of those houses, the excreta be washed down from the cess pools which wash into this stream and thus decimate that handsome village; as was the case with Plymouth in times gone by.

All these might constitute a nuisance, but an inadequate supply of water would equally cause disease for want of proper use of the water for cleanliness, or for proper culinary purposes.

I will mention a point here which many may be surprised to hear. Some of the poorer classes, either from their laziness or their inability to get water without too much expense, have the habit of cooking and washing in the same supply of water. Fancy it! Hence is it to be wondered at that such people are often rendered ill and from an unknown cause? As some too readily say, "A visitation of God." But I will not detain you longer; I will merely indicate in a cursory way, by notes of cases, the proper method of inspecting public buildings.

First, commence with the foundation; and when I say that, I mean a great deal. I mean that I see continually in the big city of Philadelphia, houses being built upon a foundation from which the filth has not been removed prior to the laying of the foundation of the house. I mean that I have seen again and again, instances where the foundation stones were laid in ground that was so reeking with filth, that it was marvellous the workmen were able to work on account of it.

Made ground is always dangerous, as where a building is erected upon ground which has been filled with garbage, ashes and the like.

Always examine it from cellar to roof. I would especially examine the ventilation. And here I may give you an instance how the very best ventilation may fail of its purpose, occurring in a neighboring city where a school house had been put up with the best possible means of heating and ventilation. In a short time after the school was occupied, teachers and scholars alike began to have headaches, vertigo, sick stomach, and in a short time the school was in such a condition that the people were afraid to go into it. An investigation was ordered, and a friend of mine (a very good sanitarian by the way), was on that committee; the remark was made by one of the committee "It is not necessary to look around much; this certainly must be something we can't understand, because the very best appliances have been put here for the purpose of ventilation." My friend went into the cellar and he found the chamber where the cold air was intended to come in, and then be warmed to be carried to the rooms, had been closed up by a son of the janitor and converted into a chicken coop. Hence, the cold air which was allowed to come in from the outside to a certain extent, when the chickens were not too cold, by that means was brought up fouled by the excreta from these chickens.

As if this was not enough, when they went to the roof a patent ventilator which had been put up at a great cost, had been stopped from its use, and had been converted into a pidgeons cote. Now, if there could be anything more stupid, anything more ignorant, in the effort how not to do a thing I would like to know it.

The subject of air from the cellar to the heater has been already so well spoken of I can add nothing to it. You know all about that. I can, however, tell you a little incident that occurred in my own neighborhood. A family was surprised to find that in spite of all their cleanliness, their house was continually laid in ashes; every portion of their house that was supplied with hot air from the heater was covered with ashes. Upon a proper investigation it was found that the air supplied, was not taken from outside, but was from an opening directly opposite the ash heap, and, of course, it was continually drawing in, along with the air, a quantity of ashes, which were disseminated through the house.

The gentleman who was the owner of the house, by the way, told me something very peculiar. He is not a tobacco user; but after it was fixed so as to have cold air brought in from the outside, he couldn't understand why every now and then there would be a strong smell of tobacco even in his third story, and sometimes, a smell of something a little stronger. His attention was called to the explanation of it by hearing a nice little altercation on the outside. He looked out of the window and found a couple of very drunken individuals with big cigars or pipes in their mouths, having a wordy controversy on the step right

in front of the window, which allowed the cold air to come into the heater. Hence, of course the cold air brought in the fumes of whisky and tobacco.

The air in the steam heater is continually fouled by want of proper cleansing of the boiler, from which that heater is supplied. Of this I can mention an instance of one of the most prominent schools in Pennsylvania, which was rendered almost uninhabitable by this very fact. The engineer had allowed a little water to accumulate there, and that water had a large number of small decaying fish in it, which were continually being boiled and thus the fumes of decayed fish, were carried all over the house.

Again, in another instance I knew that the servant who supplied the vessel with water from which the hot air came, carelessly supplied that water by means of a garbage bucket, which, of course, was not in a very cleanly condition; hence the odor of decaying garbage was carried over the house.

Finally, we must remember that in spite of all our efforts, in spite of all our teaching, in spite of all our nurses in our sick rooms, eternal vigilance is the price of our being able to keep ourselves from disease. One more illustration on that point and I will close.

In the year 1866, I had a case of cholera at one of the most prominent hotels in Philadelphia; I had a carefully trained nurse in charge of the case. Her orders were to remove the dejecta the moment they were passed. One day I went in suddenly; she evidently was flurried, and after I examined my patient and found that she was not improving as I would like, I said, "Nurse, there is an odor in this room I don't like, and my rule is not to depend upon the nurse but to look for myself." And in hunting around I found in a corner, among some clothing that had been hastily put aside, a vessel two thirds full of cholera dejecta standing there as a means by which to disseminate that disease, not only through that room, but perhaps through other portions of the house.

The PRESIDENT. The next paper is the "Importance of Vital Statistics from a Physicians Standpoint," by G. E. Abbott, M. D. of Bryn Mawr, Pa. I will call upon Doctor Atkinson to read it.

(Paper read.)

The CHAIRMAN (Mr. Herron in the chair). The paper just read is now open for discussion. If there are no remarks the next paper is by Preston H. Bailhache, M. D. Surgeon U. S. M. H. S, San Francisco, California, on the Cremation of Garbage.

Doctor LEE. I would state on behalf of Dr. Bailhache that, after he promised to prepare his paper, he was ordered to California (he is a surgeon of the Marine Hospital Service); he placed his paper together with the accompanying documents in a trunk so they could be looked

at as soon as he arrived, and that trunk was lost in transit ;consequently the paper itself is wanting.

The subject however of garbage cremation is one of practical importrance. Garbage cremation is successfully carried on in this city, and I trust there will be some one present who will be able to give us some of the details of the success of the experiment here. I understand there are two garbage crematories successfully operating, one for Pittsburgh and one for Allegheny, and I should be extremely glad to hear something in regard to them.

The CHAIRMAN. We should be glad to hear from any person on that subject.

Dr. ATKINSON. I know nothing about the garbage crematory but I do know I have in my room at the hotel a very successful garbage cremator for use on a kitchen fire. I did not expect we would get this far down the programme or I would have brought it along with me. I had a sample of this machine sent me and I proposed to exhibit it here. I do not know anything about its value but I do know from an inspection of it it looks to me as if it ought to do its work.

I was told by the Ladies' Health Protective Association of New York, that they had been very successful in using it in their homes. A number of them have formed an association for the protection of their health, and they use this garbage cremator in their homes on their kitchen fire, and they have no trouble in getting rid of all their kitchen garbage without any odor whatever. I do not know whether we can have a chance to put it in practical operation in this room, but it certainly would be a good idea if we could have some garbage brought here and burn it up before you in this machine and prove to you whether it is good or bad.

On Motion, Adjourned.

THIRD SESSION.

Convention called to order by Chancellor M. B. Goff, of the Western University of Pennsylvania..

The CHAIRMAN. Dr. Lee, Secretary of the State Board of Health desires to make an announcement.

Dr. LEE. I desire to announce that the following invitation has been received.

"WILLIAM METCALF, *President.*
SANITARY CONVENTION, PITTSBURGH.

DEAR SIR:—At a meeting of the Executive Committee of the Homeopathic Medical and Surgical Hospital and Dispensary of Pittsburgh, a resolution was passed extending an invitation to visit the Hospital,

to the members of the Sanitary Convention and the State Medical Association."

I would move that the invitation be accepted with thanks.

This motion being duly seconded was unanimously carried.

Dr. LEE: I desire to make an apology to the City of Pittsburgh. I made a statement here this morning to the effect that a very admirable system of notification of contagious diseases was carried out in this city, which I believed to be superior to that of any other city in the country.

It reminds me of a little story of an Irishman who came to this country and got occupation with a mercantile house in Philadelphia. After he had been with the house about a month he came to a leading member and said he would like the gentleman to write a letter home for him. "Well, Pat, what do you want to say." Pat sent his love to his mother, and said one or two things. Then he said, "Tell her I get meat once a week," "Why," the gentleman said, "what do you mean by that Pat?" "You know you get meat every day." "Yes," he says, "I know, but if I tell her that she would not believe it."

Now the statement I made this morning was that twice a week the Board of Health of Pittsburgh, notified every school teacher in the city of every case of contagious disease occurring in the district from which pupils to the school came. I have since had put in my hands this paper, which I am told is issued, not twice a week, but every day, containing the name of every case of contagious disease, the ward, and the house in which that disease exists; and this notification is sent every day to every teacher in Pittsburgh. I feel that this apology is due the city.

The CHAIRMAN. I have now the pleasure of introducing to you Dr. Jackson Piper, who is President of the State Board of Health of Maryland, who will deliver the Annual Address.

17.—ANNUAL ADDRESS.

JACKSON PIPER, M. D.

Ladies and Gentlemen, Sanitarians and Members of the State Board: I am here this evening, by invitation of the energetic and accomplished Secretary of the State Board of Health, of this great Commonwealth, to add my humble quota towards the advancement of sanitary science.

Unlike European countries, where reforms are fostered and maintained by the strong arm of government, we, in this republican land, must be influenced by the consent of the popular will, consequently our efforts must be directed towards the education of the masses.

We cannot expect to effect any great results in sanitation unless public sentiment is with us. I hate to acknowledge this; in this matter I am sometimes, strongly inclined to believe that conviction is apt to

follow a heavy fine, that the apathetic, the ignorant, and the wilful cannot always be controlled by reason, that no individual in the community has a legal right, by his own sweet will, to endanger the health and lives of others, and that what is good, should be made good by the strong arm of the law.

But I am admonished that these views are not tenable, by the presence of so many obsolete laws already on our statute books, and by the bitter fight that local option is now waging on this line and meeting with, alas! so many dismal failures.

The science of sanitation is scarcely 30 years old, and already great results have been obtained.

It is possible, however, that its theory is somewhat in advance of its practice. We have established our kingdom, but have not quite peopled it with willing subjects. We will have to work back a little—educate, persuade, temporize. There are always a few in every town, city and county to help us. Mr. Frank Hamilton, President of the State Business Men's Association of Michigan, in an address delivered at Traverse City, has concisely defined our position in the following words: "We owe a debt to our State Board of Health, for its efforts to enlighten the people upon matters conducive to health, happiness and longevity. Men who have risen above and are superior to their professions and occupations, are the men who are the public benefactors of to-day. Physicians, admitted into every home, see with trained vision, unknown to us, the polluted soil, the tainted water, the adulterated food, the lack of ventilation and a host of dangers in our surroundings; they welcome anything which will stimulate men and women to properly care for their homes, which will arouse them to their responsibility for the preservation of the health not only of their own families, but of their neighbors, by the prevention of diseases—disease caused more frequently by subtle germs, than by open and visible agents. Whatever advantage nature has accorded in the site of our dwelling places, man by his ignorance or indifference may soon destroy; therefore, it behooves one to guard well the gifts held within his grasp, and to check the tendency towards pollution, by educating the ignorant and arousing the indifferent. The personal and public responsibility of each citizen is of the greatest significance. The official guardians of health, the physicians, the boards of health, the students of sanitary science, may pour upon us their vast stores of knowledge, they may convene, resolve, agitate and discuss, but without the hearty response and cooperation of the citizen, their efforts will prove of little worth in raising the standard of health and the value of human life."

In what way are we to instil this knowledge, and increase and strengthen our hold upon the public? Let the principles of sanitary science and of hygiene, be taught in our public and private schools. See that our legislatures are composed of men having sympathy within and

knowing something about the laws of health. Preach the gospel of cleanliness amongst men, women, and children, amongst mechanics, farmers, merchants, divines, and physicians. Let the wealthy, by charitable bequests, endow chairs of hygiene in our colleges. Obtain the active co-operation of the ladies. They are by nature sanitarians. They hate dirt! If it were not for the thorough cleansing they give our houses from cellar to attic twice a year, there would be much more sickness. They destroy more micro-organisms in one year than we men do in a hundred. If they would only not crowd their windows and doorways with so many heavy curtains, they would be perfect. But flies and sunshine are destructive to furniture, and this is a strong argument in the female mind against a more *enlightened* method of treating so *dark* a subject.

Let the medical and secular press give us hearty and active support. Look at the comment made by a distinguished editor of a medical journal published in Baltimore, on a late meeting of the State Board of Health of Maryland.

"The State Board of Health held its quarterly meeting last Tuesday. The old questions of drinking water and sewerage were discussed." This was all, nothing more. Three lines of printed matter, only three lines! And yet the Board modestly thought it *was* an important meeting.

The following subjects were discussed and in part acted on. A committee to examine into our food supplies and to ascertain the presence of tuberculosis and pleuro pneumonia in our cattle, with a view to prevent the sale of diseased meats in our markets. The co-operation of all state boards of health, with railway and steamboat companies for the safe and secure transportation of bodies infected with contagious diseases, and new methods of sewage disposal now in use in Europe.

In the same edition of the said journal, more than a page of editorial matter is devoted to Souchou's remarkable method of drilling holes through the cranium, and inserting into the brain hypodermic needles to prospect for foreign growth and hemorrhagic effusions.

If any scientist in the assembly would devise a plan for applying electrodes to these holes and galvanize into active working life, the sanitary sense of all recalcitrant editors, he would deserve well of the state.

But the press, both civil and professional, I am glad to say, renders us important and vital aid. The medical profession has ever been with us, except possibly a few who fancy that sanitary methods must injure their means of support.

But the prevention of preventable diseases increases population, and there will be so many the more to practice on at the *longer end* of life.

For the successful sanitation of our country town, it is essential that we secure intelligent and liberal minded men in our boards of county

commissioners. But we do not secure them—they *secure* us. And just here comes in a most difficult problem to sanitary success.

We have discovered ready means for destroying microbes, bacilli and micro-cocci, but no antidote has yet been found for these dangerous micro-organisms poli-*tics*. They are pestiferous spirilla with never dying spores.

What a field for their discussion is here opened to the bacteriologist! If he could discover a germicide for these fungi how speedily sanitation would progress. But it would have to be a *germicide* for the Germans, and an *irishcide* for the Irish, as the average American voter is made up of six of one and half a dozen of the other. Having secured our legislatures, our county boards and the popular sympathy, our next move would be to get an intelligent, firm and fearless sanitary officer. A dozen chances to one that the youngest and most inexperienced physician in the town, secures the position. Why? because as he has little to loose and much to gain, he would accept the place at a salary that would ruin an older practitioner. It is a dangerous position, that of sanitary officer. It is worth a man's meat and bread, *if he does his duty*, and no responsible man can afford to sacrifice these for the petty salaries offered. Just here, I am afraid the wily politican may impugn my motives of him as being not altogether unselfish. Candor confesses that while the theory of sanitation is beautiful, its practice is abominable. You are very liable to be regarded by very many as no better than a police officer, and a poor one at that, and police officers can be had *cheap*.

Having obtained our workmen and our laws how shall we proceed in our country towns and country residences?

Impure water, pollution of rivers and streams, sewage, cess pools, foul water closets, pig pens, henneries, stables, manure heaps, unclean cellars, damp houses, swamps and stagnant pools, decaying vegetation, slaughter houses, tanneries and cemeteries—these are the Hydra headed monsters that rend earth, air and water and, like Pandora's box, let loose upon us most of the ills that flesh is heir to.

While Ulysses slept his curious crew unloosed the mysterious bag that held the unruly winds, and misfortunes followed. The helmsmen that steer the good ship Hygieia must be ever on the alert—ever watchful or else the foul winds of pestilence will drive her to destruction.

I have read with much interest the two excellent reports issued by your State Board and I find a similar condition of affairs existing in your State as in mine.

Many of the towns in the thirteen original States are old and their very soil is so polluted by the sewage deposit of years that it is questionable if any system of sanitation can restore it to its pristine purity. The Maryland State Board of Health, last summer, ordered a competent chemist to make twenty-seven quantitative analyses of the well waters of nine towns

Every specimen examined proved to be polluted by animal and vegetable excreta and in consequence unfit for use.

Seemingly fair to the eye and to the taste, they have proven to some and will prove to others, as fatal as the poisonous waters of the Stygian lake. The shades of the dead drank a draught of the waters of Lethe, when entering on the joys of Elysium, and ceased to remember the troubles and sorrows of life. And so a pathetic and oblivious is the average villager to the unsanitary condition of things around him, that it might be inferred a draught of his well water had a like effect upon him were it not for the fact that he is oftentimes rudely awakened from his lethean slumber by some valued and beloved member of the community being *untimely* hastened into eternity.

It is no argument to say that because you or I or our families escape sickness, after a prolonged use of such waters that they are therefore innocuous. Brinerdel says: "The reception of the morbific influence is personal to each one, depending upon age, the conditions of previous or actual health, &c., The dose so to speak, of the virvus introduced or innoculated has also an influence on the morbid manifestations which result from its absorbtion. Again, some of the morbid agents live in water a certain time, then disappear, and their activity and virulence vary with the age of the colony. There are various other circumstances moreover, which will afford immunity more or less complete and prolonged."

So far as the water is concerned, the danger of using it can be overcome by the construction of artesian wells and from natural flow. But this does not meet the difficulty in the ground air which comes to us freighted with poisonous germs from sewage soakage. For this we need a system with instant removal of excretal matter, our stables laid in thick plank to catch the fluid dejections and convey them to water tight barrels, to be carted to a distance—the manure to be stored in sheds protected from the rain, kitchen slops either collected or allowed to filter through properly constructed disinfecting barrels, well walls laid in thick Portland cement, or in bricks steeped in a boiling solution of equal parts of asphalt and tar, said bricks set by means to be employed. I saw a statement sometime ago that a chemist in England had discovered that iron plates suspended in polluted water purified it by oxidization. This fact was established by careful analysis. A practical use could be made of this, by constructing the walls of wells. and cisterns in circularly made iron plates. These plates could be made at some of our foundries and might possibly open up a new industry to some enterprising firm. Boiling the water has the effect of destroying the dangerous properties of putrescent matter and the use of filters would deprive the water of noxious elements.

I am aware that the majority of filters are the worst sort of culture beds for zymotic germs.

Dr. Plagge, of Berlin, has shown that the results of Bischoff's spongy iron method were disappointing. Carbon filters on Pasteur's principle gave in nearly every instance a filtrate practically free from germs.

Abestos filters gave an apparently free filtrate but developed germs later on. His experiments point to the desirability of using filtered water soon after it is filtered.

Dr. C. W. Chancellor, Secretary of our State Board, recently returned from Europe, made the following interesting and important report in relation to water pollutions and how Europe was not treating the subject, and also some new methods of treating town sewage.

He said that every precaution would have to be taken against impure water, so long as the water is not filtered at the pumping house or before it is delivered in the mains, as is done in London and all the chief European cities. Continuing, Dr. Chancellor said: "Water ought to reach houses perfectly fit for drinking, but if one may rely on the smell of our drinking water at certain seasons, it is far from being at all times free from noxious matters even when it leaves the reservoirs, and the community has to submit for a short time every summer to this domestic abomination; and thus it will be until the supply is filtered at the pumping-house or before it is delivered in the mains, as is the case with the water supply of London and nearly every European city. The water supply of Antwerp drawn from a filthy river is filtered through beds of spongy iron and black oxide of manganese before being delivered to customers, and the result of more than two years constant running has to a great extent confirmed the expectations formed respecting the spongy iron filtration. The water has not varied in brightness or quality, and the filtering beds seem to be nearly unaltered. Under the circumstances attending our present water supply in Baltimore, every house would do well not only to boil the water used for dietetic purposes, but also to set up a good filter, and, what is perhaps of even greater importance to take care that it continues to be a good one. It is a very common and a very dangerous assumption that "a filter is a filter," and once set up may be relied on for an indefinite period. Another delusion is the so-called "self cleaning filter." It is much better not to filter water at all than to believe in such precepts. There can be no hesitation in assuming that the result of the purification must be in a ratio to the care bestowed on the filter. The material in domestic filters should be readily accessible in all their parts for cleaning and renewing, more especially if vegetable or animal charcoal is used; for although this material may prove satisfactory for a short time as a chemical purifier of water, both chemists and biologists are agreed that its use in the purification of drinking water is attended with much risk; and since the progress of science has revealed the deadly action of living zymotic poisons which occur in contaminated waters, another and a much more serious danger, through the use of charcoal,

has shown itself. The Commissioners "On Rivers Pollution" of England, have thus expressed their views: "The property which charcoal possesses in a high degree, of favoring the growth of the low forms of organic life, is a serious drawback to its use as a filtering medium for potable water."

From what has been said, it is quite evident that no orgainc substance can be employed with safety as a filtering material, and, therefore, the discovery and production of a perfect mineral filtering material is a matter of great sanitary importance. The material which presents the largest surface for the occlusion of oxygen in the smallest cubical space, is the most powerful purifier and filterer, provided it is composed of the proper substance.

Spongy platinum fulfils these conditions best, and is consequently the most powerful purifier and filterer, and the best insoluble oxidizer known.

Its enormous price, however, shuts it altogether out from practical use, and spongy iron has been used in its stead. But a better and cheaper filtering material than spongy iron has very recently been produced in England, and is now being used in that country on a large scale for both public and private filters. This substance which is know as "magnetic ferrous carbide" is absolutely and entirely free from contamination with animal or vegetable matter, and contains no poisonous metals. The admixture of this substance with sand or gravel forms a filtering medicine which purifies itself by deordorizing and disinfecting oragnic impurities, which would otherwise contaminate such beds. The process of combustion is constantly going on in the pores of the material, and the products of that combustion are tasteless, odorless, colorless and perfectly wholesome, creating carbonic acid, with which the water becomes charged to a limited extent, rendering it sparkling as well as palatable and wholesome in the highest degree.

Polluted water taken from the river Thames, below London bridge, was passed through a filter composed of this material and on being then analyzed was found to be purer than any of the drinking waters supplied by the London water companies."

A New Treatment of Town Sewage. "For sometime I had been watching with interest the developments of a new system of treating town sewage in England, and in my recent visit to that country I was shown the whole process at Acton, a town of thirty thousand inhabitants. The method is quite simple, and comparatively inexpensive except in so far as the plant and the laying of the necessary transportation pipes are concerned. It consists in effecting rapid precipitation of the solids and deodorization of the supernatent liquids, and in the removal of the organic matter in solution by passing the effluent fluid through specially constructed filter beds.

The precipitant and deodorant is known as "ferozone", and the fil-

trant as "polarite." The evidence of numerous well-qualified authorities goes to show the importance of this method of treating sewage matter, both from an economical and sanitary point of view. The effluent produced at the Acton works is the purest, and the sludge the least in bulk and best in quality yet produced.

The precipitant (ferozone) flows with the raw sewage into a large precipitating tank of 130,000 gallons capacity. Of these there are three side by side. Subsidence is allowed to take place for a period of from one to three hours, after which the top liquid is run off from the surface by means of a floating arm direct on the top of the filter bed, which is made up of sand as a top layer, then a layer of the filtrant, the bottom being made up of gravel. The resulting filtered effluent is bright, clear and free from any objectionable smell. These filter beds have been in use more than twelve months, and the only cleansing found to be necessary is the removal of the surface layer (one or two inches) of the sand. The sludge precipitated is of considerable value as a fertilizer, since the use of lime, which is so highly objectionable, and causes the loss of ammonia is entirely avoided. By the use of the filtrant (polarite) in properly arranged beds it is unnecessary to acquire large areas of land for irrigation. These beds never require changing, a slight rest of a few hours occasionally being all that is needed to effect revivification, coupled with a flushing or cleaning of the top sand. These beds will filter sewage effluents at the rate of 1,000 gallons per square yard per 24 hours, with better results than can be obtained by land filtration at the rate of 1½ gallons per 24 hours; or, in other words, one acre of filtering area, containing a layer of polarite and sand, mixed in equal proportions, will do more efficient work than 666 acres of land.

It is possible in our large towns, villages and private residences to do away with the abominable common earth closet, and defective trap system of water closets and substitute a safe, cheap and efficacious method—one that will meet the requirements of a segregation of houses equally well as of a single house. I have lately examined into and seen the practical working of an apparatus, much improved since patented, invented by Dr. Chancellor, I feel confident that this apparatus will meet the great want of the age—the proper disposal of excretal matter. I shall not attempt its description here but will append one to this paper.

I shall only briefly refer to its advantages.

First. It affords absolute protection against the dangers which ordinarily arise from the decomposition of excretal matters and the refuse waters of the house.

Second. The apparatus being both water-tight and air-tight, the surrounding soil and adjacent waters are protected against any contamination by foul matters; at the same time, the dejections being excluded from exposure to atmospheric air, there is no fear of malodorous or unhealthy emanations.

Third. The soil-pipe being hermetically closed at it slower extremity, there is no circulation of air through it to carry the gasses, should any exist, into the house, and consequently no necessity for trapping the soil-pipe or for extending it above the roof. The tendency of any gas which might be disengaged from excrementitious matters adherent to the inner side of the soil-pipe will be, with each flushing process from the closet bowl, downward, and being thus carried to the bottom of the reservoir, they are absorbed by the water contained therein.

Fourth. While this system provides a means of getting rid of excrementitious and other household refuse, in a manner to satisfy the sanitary requirements of the question, it at the same time preserves them for ultimate disposal in a manner to satisfy the requirements from an agricultural point of view.

Fifth. In applying the system, the existing closet arrangements can remain as they are; and for kitchen slops, it is only required to join the sink of the kitchen and pantry with the fall-pipe from the closet, or directly with the reservoir.

Sixth. The excretal and refuse household waters, by a process of mechanical and chemical filtration, are deprived of all noxious substances, whatever they may be, in a manner to render them practically pure, and they may then be discharged into the public highways or sewers, or water courses not used for dietetic purposes, without danger of creating any offense whatever.

Seventh. The system secures to communities, large or small, cheap and effective sewerage for both household and manufacturing wastes, discharging them in a manner in which they can neither pollute air, nor soil, nor public water courses.

Eighth. Its crowning characteristics are simplicity of construction and permanence of action, with the least original outlay at which these qualities can be obtained.

Farmer's Houses Unhealthy, and Why.—In a lecture before the New York Academy of Anthropology last winter, Dr. Lucy Hall, of Brooklyn attributed the bad health of country people to the unsanitary condition of their homes. The vine-clad, shade-embowered country houses sung of by the poets and sketched by artists are really, says Mrs. Hall, the most unhygienic in existence, being far less healthy than the average city houses. The typical country house she describes as surrounded with dense shade trees, producing gloom and mould. The best parlor is always shut up closely to prevent the carpet from being faded by the sunshine and the furniture from being specked by flies. As for the bed rooms, they are often on the ground floor over a damp cellar and are ill ventilated. The room occupied by the father, mother, and small children as a sleeping apartment seldom has more than one window, and that is stuffy with curtains, shades, &c., whose only good office is to obstruct somewhat the ingress of odors and disease germs from the pile

of kitchen garbage near by. Data collected by the lecturer with respect to one hundred and sixty-five houses in New England, the Middle and Western States, show that the conditions of health are more disregarded by the farmer of New England than by there of other sections. Sleeping apartments of all the New England houses, for example, were on the ground floor, while in the Western States the percentage was but eighty-four per cent. The percentage of "shut-up" parlors was for New England eighty-five per cent., for the Middle States, sixty-eight per cent. and for the Western States, sixty per. cent. In damp or wet cellars the Middle States led with ninety-three per cent., The Western States followed with eighty per cent., and New England closed the line with sixty per cent. Shade about the house was excessive in the West and New England and at the minimum in the Middle States. Of the New England farmers houses eighteen per cent had wells in them, and the average distance of the well from the barn in that section was but forty-six feet. The Middle and Western States had much better arrangements in this respect. They used better judgment also as respect the location of water closets. The distance of the water closet from the well averaged twenty-nine feet in New England, thirty-three feet in the Middle States and about sixty-six feet in the West. One half of the New England farmers' houses have barns joined to them, and the same proportion have water closets joined to them. Slops were thrown from the back door of seventy-seven per cent. of the New England houses, from forty per cent of the house of the Middle States, and from twenty-six per cent. of the houses of the Western States. The families occupying these houses complained frequently of sickness. Some member is always ailing, but the idea seldom occurs to anybody that the doctor's bills could be saved by some attention to the construction and surrounding of the house. Of the diseases found to exist in these dwellings rheumatism was, upon the whole the most prevalent. Next after rheumatism came diseases of the lungs, then diphtheria, typhoid fever and bowel troubles. Lung troubles, typhoid fever and diphtheria are especially aboundant in New England as was to be expected form the facts recited above. It is in the Middle and Western States that rheumatism most abounds. But besides these diseases, there are frequent cases of kidney trouble, nervous debility, melancholia, throat affections, etc.

The remedy is to build country houses with large and sunny rooms, with shade trees at a due distance; to have the well safe from the drainage of water closets and stables; to put all out buildings at a proper interval; to use only the rooms on the second floor as bed rooms; to cement the cellar and extend it under the entire house and not to use it as a receptacle for vegetables meats and other perishable matters and to use temporary awnings instead of permanent pojecting porches. The average woman has a mania to keep out sunlight She is to be

withstood, and windows are to be used for the purpose for which they were originally constructed. Above all, if it is desired to improve existing country dwellings, it is necessary to demolish contiguous barns, pig styes, henneries and other like offensive out-buildings. To advance such improvements, according to Dr. Hall, is the duty, if not the interests, of the country doctor, who, when properly educated cannot but be aware of the un-sanitary condition of his patients' homes. It was suggested by a sagacious anthropologist, at the conclusion of a lecture, that the duty of educating the country people in sanitation rests on the pulpit and the press, as much as on the doctors, this is, no doubt, the fact. Every one that understands the ruinous results of living, or trying to live, with unsanitary surroundings should join in the work of reform."

In conclusion, thanking you for your kind attention to this my feeble effort, imperfectly rendered, I will take the liberty of giving you all a prescription for "How She can be told".

How can I tell her?
By her cellar;
Cleanly shelves and whitened walls.
I can guess her
By her dresser;
By the back staircase and hall.
And with pleasure
Take her measure,
By the way she keeps her brooms.
Or by peeping
At the keeping
Of her back and unseen rooms.
By her kitchen's air of neatness,
And its general completeness,
Where in cleanliness and sweetness
The rose of order blooms.

The CHAIRMAN. The paper just read is open for discussion.

Dr. LEE. Mr. Chairman: I am sure we have all listened with great interest and pleasure to this delightful and very suggestive address. I therefore move that a vote of thanks be extended Dr. Piper, and that he be requested to furnish a copy of his paper for publication.

This motion was seconded and carried unanimously.

The CHAIRMAN. I now have the pleasure of introducing to you Dr. Henry B. Baker, of the State Board of Health of Michigan, who will read a paper entitled "A plea for Public Health Work in Villages."

A PLEA FOR PUBLIC HEALTH WORK IN VILLAGES.

By HENRY B. BAKER, M. D., *Secretary Michigan State Board of Health.*

When a fire breaks out in a village every person considers it a duty to give a general alarm, and especially, prompt notice of it to the fire department; and all citizens co-operate for the speedy extinction of the fire. If this were not done, the property in the village would be quite generally endangered by the possible spread of the fire. Why is it that when a dangerous communicable disease breaks out, one which may spread and endanger quite generally the lives of persons in the village, there is so frequently no such general alarm and prompt notice to a well-organized department of the village government, and no general co-operation for the extinction of the disease? Is not a person's life of more consequence than his property? Is not the saving of the lives of their children of as much consequence to the inhabitants of the village as the saving of their property? If each person were forced to answer this question, relative to his own children, I believe that he would feel like a degraded miserly wretch, if he did not promptly sacrifice his property in defence of the life of his child. Yet, collectively, the citizens generally do not do for the protection of *property*—they do not maintain a well-organized health department so generally as they do a well-organized *fire* department. I believe it is because they do not so generally know that lives may be saved by well-organized health departments, or because they do not know the value of human life to the community.

It is the purpose of this paper to point out some of the ways in which lives may certainly be saved by a good health department, and to indicate something of the money value of human life; for, notwithstanding a general repugnance of people to weigh the life of fellow beings, and to estimate their value in dollars and cents, yet, in some way it is important that people generally shall come to see that public health work in villages will "pay" in dollars and cents, as well as in the consciousness that the lives of loved ones are saved.

In order to be somewhat precise in our study of this subject, let us fix upon the size of the village which we will especially study; and, in order to have the figures in "round numbers" let us study especially the average village having about twenty-five hundred inhabitants. If we consider the usual death-rate from all causes to be about seventeen in each thousand inhabitants each year, there will be, in our average village, forty-three deaths in each year.

DEATH RATE IN PENNSYLVANIA—CITIES.

CITIES.	Year.	Population.	Deaths.	Deaths reported to 1,000 inhabitants.
Reading,	1886,	52,250	861	16.4
Reading,	1885,	50,500	1,025	20.2
Reading,	1884,	49,000	917	18.7
Reading,	1883,	47,500	869	18.2
Reading,	1882,	45,750	890	19.4
Philadelphia,	1887,	969,431	21,719	21.9
Philadelphia,	1886,	971,363	20,005	20.59
Pittsburgh,	1886,	206,000	4,225	20.6
Pittsburgh,	1885,	195,000	3,840	19.7
Pittsburgh,	1884,	185,000	3,753	20.0
Scranton,	1886,	. . . .	1,067	13.33
Erie,	1886,	33,215	579	17.1
Erie,	1885,	36,008	477	13.2
Erie,	1880,	27,730	490	17.7

The average death-rate=18.36 per thousand inhabitants.

The average death rate in the city of Phildelphia for fifteen years 1871-1885 is 21.87. 21.87+15=328.05. 328.05+257.02=585.07. 585.07 +29=20.18. Thus, the average death-rate for the above cities for the years as above; but Philadelphia for seventeen years instead of for two years = 20.18.

Then about three of these deaths will have been caused by diphtheria, about one death will have been caused by scarlet fever, and about one from typhoid fever.

The proportions which the deaths from certain dangerous communicable diseases are of the deaths from all causes in Pennsylvania are shown, for a single year, in the following table; and a similar table shows the same for the state of Michigan; but there is reason to believe that in a long series of years they would not be so large as they were in the census year. The last table for Michigan, for a long series of years, is probably near the truth, for Pennsylvania as well as for Michigan.

Deaths reported, in the U. S. Census of 1880, as having occurred in Pennsylvania, during the census year, from consumption, diphtheria, scarlet fever and enteric fever, and what the per cent. of deaths from each, and from all of these four diseases is of the deaths from all causes.

All Deaths.	Sum of Deaths from the four Diseases.	Consumption.	Diphtheria.	Scarlet Fever.	Enteric Fever.
63,381	17.451	8.079	5.481	2.241	1.660
Per cent.	27.32	12.63	8.58	3.58	2.60

Deaths reported in the U. S. Census of 1880, as having occurred in Michigan, during the census year, from consumption, diphtheria, scarlet fever and enteric fever, and what the per cent. of deaths from each, and from all of these diseases is of the deaths from all causes.

All Deaths.	Sum of Deaths from the four Diseases.	Consumption.	Diphtheria.	Scarlet Fever.	Enteric Fever.
19.734	5.672	2.602	1.995	5.28	5.47
Per cent.	28.73	13.18	10.10	2.67	2.77

The number of reported deaths, from all causes, in Michigan during the thirteen years, 1874-86; also the number of reported deaths from consumption, diphtheria, scarlet fever and typhoid fever, during the same period, and what the per cent. of deaths from each, and from all of these four diseases is of the deaths from all causes.*

All Deaths.	Sum of Deaths from the four Diseases.	Consumption.	Diphtheria.	Scarlet Fever.	Typhoid Fever.
198.718	48.253	23.496	12.998	5.423	6.386
Per cent.	24.3	11.8	6.5	2.7	3.2

By the above table, it will be seen that 3.2 per cent. of all deaths have been from typhoid fever, 2.7 per cent. from scarlet fever, 6.5 per cent. from diphtheria, and 11.8 per cent. from consumption; and that 24.3 per cent. of all the deaths have been from these four diseases, which are now believed to be in great part preventable by measures which are practicable, by intelligent people in connection with the services of an intelligent and efficient local health officer, co-operating with a state board of health.

But in the average village they will occur; and in a long series of years the deaths from these diseases in each and all of the villages of this size will average rather more than the figures I have just mentioned.

I have selected these three diseases (diphtheria, scarlet fever and typhoid fever), because these are the most common dangerous communicable diseases, and because they are diseases which we know how to prevent; and we know how to restrict them after they have been introduced into a community. On this point, as I am more familiar with the evidence collected in my own state, than with that collected by your State Board of Health in Pennsylvania, I will present to you a few facts collected in Michigan: –

*Compiled from Registration Reports of Michigan.

Diphtheria.

In 1886, 464 outbreaks of diphtheria were reported to the office of the Michigan State Board of Health, and the health officers were requested to report just what was done to restrict the disease, and how many cases and deaths occurred in each outbreak. From these reports it is possible to see under what conditions the most cases occur. The results of this inquiry are graphically exhibited in a diagram, copies of which are here for distribution to each of you who may be interested. In this diagram, by comparing the last two columns with the two immediately preceding, it will be seen that in those outbreaks in which the isolation of infected persons and things, or their thorough disinfection, after death or recovery, was neglected there were about five times as many cases and five times as many deaths as there were in those outbreaks in which both isolation and disinfection were enforced. This is equivalent to saying that by complete isolation of those sick with diphtheria, and the thorough disinfection of all infected persons and things, at least four-fifths, in other words *eighty* per cent. of the cases of diphtheria, and of deaths from that disease, have been prevented by restricting the disease, after it has been introduced into the localities. Similar facts were shown by the statistics for the year 1887, and by those for 1888. For the year 1888 we compiled the reports so as to show the results when both isolation and disinfection were neglected; and it was shown, as would be expected, that, compared with this, the saving by isolation and disinfection was greater than eighty per cent. of the cases. The average of the three year's experience shows a saving of over seventy-seven per cent. of the deaths.

It is proved, then, that if we employ the measures with which we are familiar, and which are described by three words—isolation and disinfection—we can prevent, say seventy-five per cent of the deaths which otherwise will occur from diphtheria.

Scarlet Fever.

Similar reliable statistics, collected by the Michigan State Board of Health, have proved that, after the disease is introduced, eighty per cent of the deaths which otherwise would occur from scarlet fever, can be prevented by thorough isolation and disinfection of all infected persons and things. Copies of a diagram exhibiting facts relative to scarlet fever in Michigan during the year 1886, are here for distribution.

Typhoid Fever.

Such absolute proof of the accomplishment of the restriction of typhoid fever as I have given you relative to diphtheria and scarlet fever, I have not here to present to you; but theoretically, typhoid fever is more easily restricted and prevented than is either diphtheria or scarlet

fever; because it is not usually spread directly from person to person; and it may be restricted by the thorough disinfection of everything which comes from the patient; and it may be in great part prevented by drinking no water except that which has been sterilized by having been boiled.

It has been said that for every death from typhoid fever some person should be held criminally responsible. This implies that the disease is preventable, and that it is the *duty* of *every* person to know how it may be prevented

In common with other state boards of health, the Pennsylvania State Board issues copies of a pamphlet (Circular No. 18) giving brief directions how to restrict typhoid fever. By complying with its directions, at least eighty per cent. of the cases and of the deaths which otherwise will occur from that disease may probably be prevented. If we save seventy-five per cent. of the sickness and seventy-five per cent. of the deaths from diphtheria, scarlet fever and typhoid fever, what does this amount to in the average village or borough of twenty-five hundred inhabitants? Let us see.

We have seen that the average village of that size has in each year, on the average, about three deaths from diphtheria, one from scarlet fever and one from typhoid fever. From the two last mentioned diseases the average is rather more than one death, so that seventy-five per cent. of the deaths would amount to about one death from each disease each year. Seventy-five per cent. of the deaths from diphtheria would equal two deaths, annually. From the three diseases, then, four lives would be saved. The three saved from diphtheria and scarlet fever will be under ten years of age, and the person saved from death by typhoid fever will be in the middle age—in the "prime of life."

When lives of young or middle aged persons are lost to a community something else is lost, namely their prospective earnings,—the wealth which otherwise they would have created. There are several ways of estimating the extent of this loss:—A few years ago a good negro slave was valued, for what he would earn in excess of the cost of his keeping, at about eight hundred dollars: statisticians would value a person in the prime of life as worth to the community about one thousand dollars. Children are worth as much less as it will cost to raise them to the most productive age. If the three children which may easily be saved in the average village, are estimated as worth half the full average value of a person then if their lives are saved there is a saving of fifteen hundred dollars; and if the one adult life is saved from typhoid fever, there is a saving of a thousand dollars—and, from the three deaths prevented, a saving of twenty-five hundred dollars—a dollar for each inhabitant of the village.

Facts, which I consider incontrovertible, prove beyond reasonable doubt that, in the average village or borough of twenty-five hundred

inhabitants in Pennsylvania, this average annual saving of lives and of money value may be easily accomplished, with reference only to the three diseases I have mentioned; leaving out of the account all saving of sickness, and all saving from deaths which may occur from other diseases. Surely the saving of these lives is well worth the effort of your people! The exact methods of work may be stated further on, but it will require the general co-operation of the citizens of the village; it cannot be done except by *organized* co-operation. In other words, it will require an efficient local health officer; and then the citizens must co-operate with the *health* department of the village as promptly and thoroughly as they now do with the fire department. It will require such a public opinion as will hold the health officer steadfastly to his duties, and such as will pay him so well for his services that he can afford to do his best for the *prevention* of disease, leaving to other physicians the care of those already sick. To do this requires money—money by the hundreds, perhaps by the thousands of dollars, every year, but I have proved that, by such work as can be done by and in connection with an efficient local health officer, with reference to three diseases alone, there can easily be saved in each average year, lives which at ordinary estimates would add to the wealth of the community at least twenty-five hundred dollars. If, then, our average village shall expend twenty-five hundred dollars a year in public health work, it will only be paying, to the health officer, and a few others, as much as without such payments is actually lost to the people of the place. Is it not better to pay this money for public-health service, than to bury that of as much actual money value in the graveyard?

We will admit, if you please, that when deaths occur the loss is not equally distributed among the people of the village; generally the loss falls most heavily upon the bereaved family; and this is especially true if the death is of the bread-winner of the family. But it should not require much argument to show that the prosperity of a village depends greatly upon its healthfulness and the safety of life therein, and that, in a long series of years, the deaths are distributed somewhat equally among the people, and that, even if they were not equally distributed, a high moral sentiment should prompt us to guard the common safety of life among us. It was recognized even before the Declaration of Independence, that to each citizen the right to exist, the life of the individual is among the unalienable rights to secure which "governments are instituted among men." It is plain, therefore, that one of the highest, perhaps the very highest, function of a government is to guard the *lives* of the people.

Having reference, then, to only *three* of the most important communicable diseases, it seems plain that the average village has the undoubted right, and can well afford to expend, in every year, two thousand five hundred dollars, for the restriction and prevention of diphtheria, scar-

set fever and typhoid fever. And I think there is good reason to believe that the citizens of the average village would incidentally save lives and cases of sickness from other diseases than those I have mentioned; and, besides, in my account of losses by those three diseases, I accounted only for the losses by reason of the deaths, leaving out of the account all the great expenses incident to the sickness.

What is the Exact Nature of the Work to be Done?

I would not have the health officer, or the Board of Health neglect any duty which is now required by law or custom. Nuisances should be abated; even if there is no absolute certainity as to just how they may cause sickness. House-to-house inspections by the health officer may well be maintained at regular intervals. Such inspections yield knowledge useful by the health officer in some of his duties, as, for instance, those for the prevention of typhoid fever. But none of these things, which it has so long been considered the sole duty of the health officer to attend to, have much to do with the restriction or prevention of scarlet fever, and probably not with diphtheria. For that work entirely new methods must be employed. To do this work, the health officer, and the people who co-operate with him, must have a good theoretical knowledge of the "germ theory of disease."

A few years ago it was generally believed that all we had to do to protect ourselves from all the dangerous diseases was to clean up and to keep clean; it was thought that these diseases, were all produced in filth. Now we know that this is not true; that while typhoid fever probably is reproduced in filth, outside the body, or, if its specific cause is not reproduced, certainly it is *stored* in the filth outside the body, and all ordinary measures of cleanliness are important for the prevention of that disease, it is not true that all diseases are thus caused, or that anything worthy of mention can be done for the prevention of some of the most dangerous of them by attention to ordinary cleanliness. To show how strong the evidence on this subject is, I may mention that for several years there has been offered a prize of a thousand dollars to any person who shall demonstrate the possibility of reproducing, outside the animal body the vaccine virus or the modified virus of small-pox capable of preventing small-pox in the way well known to be accomplished by vaccine virus propogated in man or animals. No one has claimed the prize. It seems to be impossible to find or create any conditions outside the living body which will enable this contagium to reproduce. There is no reliable evidence that the contagium of scarlet fever is reproduced in filth outside the body. There is question whether the contagium, of diphtheria can be reproduced outside the body, and still more question whether in ordinary life it is so produced. One of the things which makes it improbable that it is so reproduced is the fact, proved by the statistics supplied by hundreds of health officers in

Michigan, that simply by the isolation of infected persons and things, and their thorough disinfection, three fourths of the cases and deaths from diphtheria which otherwise would occur are prevented. If the disease were generated in or by ordinary filth it does not seem probable that isolation and disinfection would be so very effectual for its restriction and prevention. But it has been abundantly proved, that the contagium from any person, even if it cannot grow or multiply outside the body, yet can lie for months dormant but virulent to produce the disease whenever it is breathed in by a susceptible person; that this contagium clings to clothing, books, letters, papers, walls of rooms, curtains, and articles of furniture, and may thus re-produce the disease long after the recovery of the person in whose body the contagium was formed; that therefore, time alone cannot be relied upon to protect us from the contagium; that no ordinary cleanliness can protect us from it; that nothing is available for this purpose short of some gasoeus disinfectant which will follow the contagium to the uttermost recesses of all cracks and crannies, and will then and there attack and destroy its life. The mode of disinfection which has proved effective for the prevention of scarlet fever and diphtheria in Michigan, is the exposure of all infected things to the fumes of burning sulphur; and the State Board of Health recommends that the fumes be as strong as will be made by the burning of three pounds of sulprur in a room ten feet square, or in each thousand cubic feet of air space. Discharges from the throat and mouth are to be taken on rags, and immediately burned. But for complete directions I must refer you to the pamphlets published by our own State Board of Health.

It is important that we maintain a local health service so that, at a moments notice, all the measures for the complete isolation of a person sick with one of these dangerous communicable disease shall immediately be put in operation; that, at any time, the appropriate disinfectants, for use in the sick room and after the recovery or death of the patient, shall be ready, and shall be faithfully and intelligently used. It is important that every village have at all times, an efficient local health service so that, in case of need, it can have the benefit of the aid which can be rendered by the State Board of Health. A good health officer is powerless to protect a village unless he is supported by the people. In order that the people shall support him in strong measures for the restriction of infected persons and things, they must know wherein lies the danger, must appreciate the importance of restrictive measures, they must know how isolation and disinfection are accomplished, and how they may be made imperfect, and deaths result. This co-operation of the people, which is so important, can be had if they can be led to see the truth, and they can be led to see the truth if it is presented to them in the right way at the right time. In an outbreak of scarlet fever, or diphtheria, if prompt notice be given to the local

health officer, and by him to the State Board of Health, the local health officer can promptly be supplied with pamphlets which tell, in brief language just how to restrict that particular disease; and if the health officer distributes these pamphlets to the *neighbors* of the family in which the disease is, they will then be likely to read and to pay attention to the best methods of preventing the spread of the disease into their own families.

This may serve as a hint as to some of the ways in which an efficient local health service co-operation with the State Board of Health, and securing the co-operation of the neighbors of those sick with communicable disease, may act for the protection of life and health in the locality.

The State Board of Health publishes full and valuable instruction to those health officers who are for the first time elected for that service. These instructions also serve as reminders to those health officers already familiar with the duties of the office, also to call attention to any new law which may have passed by the legislature, or any and useful facts which may have been learned from the compilation of the reports collected by the State Board of Health. Thus every locality that maintains an efficient health service which is actively in harmony with the State Board of Health, contributes to and has the benefit of the combined experience of all the other similar boards of health throughout the State, and in fact of all the experience of similar organizations throughout the world; because the State Board of health is constantly exchanging reports of its work for the accounts of the work of other health officers and boards throughout the world. There is an old saying that "Dwarfs see far on giants shoulders." This may serve to fix in our minds the fact that a very humble and ordinary person acting as local health officer in an ordinary village, may accomplish great results by life-saving measures when he is lifted up and borne forward on the shoulders of all of mankind who are engaged in similar work, as he may be so aided if he puts himself in the way of such aid. In this work, the "Giants" are always in existence,--in many places throughout the world excellent public-health work is constantly being done and reported; but I fear that it frequently happens that a village in Pennsylvania fails to provide even a "Dwarf" to act as a local health officer. I should be glad if each village or borough in Pennsylvania would constantly employ the best physician within its limits, to act as its sanitary adviser and health officer; one who would put himself on the shoulders of all the "Giants" in sanitary science and public-health work, in Pennsylvania and throughout the world; one who would be constantly employed for the prevention and, when required, for the restriction of disease; and one who would thus save to the people of this village not only as much in money value as is expended for public-health work, but also prevent a vast amount of pain of sickness and of agony, and save

the lives of children and other loved ones who without such public-health work are constantly being torn from their parents, relatives and friends.

This is why I plead for the establishment, and for the permanent maintenance of an efficient public health service in every village. If there is as yet no law whereby every village, borough, or inhabited locality in Pennsylvania can maintain an efficient local health service, I earnestly hope that your Legislature will pass such a law, as soon as possible, and that, by governmental forms which they will respect and obey, the people of this great State may have guaranteed to them "Life Liberty and the Pursuit of Happiness" which *can* be only through their protection and exemption from sickness and deaths from preventable causes.

Dr. McCLELLAND. Mr. Chairman: I move that the thanks of this convention be extended to Dr. Baker, who has come so far to read this valuable paper to us.

This motion was duly seconded, and being put by the chairman, was unanimously carried.

The CHAIRMAN. You have heard the paper read. There will now be an opportunity of discussing it, if any one desires to do so.

Dr. PIPER. Mr. Chairman: I have been very much impressed by Dr. Baker's address. I live in the country, practice in a country town, and I know the trouble of making sanitary improvements in a village.

The difficulty is this: The Legislature puts in the hands of the county commssioners, the power to give a salary to our health officers in Maryland. The consequence is that the county commissioners, who want to be re-elected, do not give them anything—they put the salary down to $150, $200 or $300 a year, and the consequence is that some young, inexperienced man gets the position and nothing is done.

The point I want to make—and I expect it holds good here as well as in Maryland—is that the people, the sanitarians and the State Boards of Health, ought to insist upon a schedule of prices being fixed by the legislatures of our states, giving the officers a certain amount, and not leaving it optional with these fellows, who are nothing but politicians, who do not care for sanitation and who don't. care for you, for scarlet fever, or for small pox or anything else. They would rather get the small pox and live, and let us go down and die. I do think the Legislature ought to give us a proper amount to pay for our sanitary officers. That is a point (and it is so important) that you in the cities don't feel.

In Pittsburgh, in Philadelphia, or in Baltimore you don't feel it, because you are municipal governments. Your laws passed by the legislature allow the city councils to make laws: and you have your health officers in your large cities, and the citizens don't care, because they know certain machinery is carrying on the health and sanitation of those cities.

But in the country we are absolutely helpless. We have nobody to raise a hand to help us. There are men, as I said in my address, who want to do right, but they are over-powered by the board of county commissioners, who have not got any more sense than a lot of monkeys. (Laughter).

Dr. SIBBETT. As a representative of the southern portion of Pennsylvania, I would say that I have been exceedingly gratified and pleased with the two addresses we have had this evening. The one we have just listened to is so practical, so full of good common sense, that the question has arisen in my mind: How shall the people get hold of this excellent paper? What means should our State Board of Health employ, to bring a paper of this kind before the people. That is the question in my mind.

I believe that there is not one here who does not appreciate that paper thoroughly. But how are we in Pennsylvania going to get at the people? We are too ignorant, if I may use that expression, to comprehend or understand the situation. We will have to educate our people for ten years, or may be twenty years, before we will be able to do anything like what has been suggested in the paper.

Now I feel that this paper ought to come before the people in some way or other. It will not do to put it in our big report and wait two years before the report is printed. It will not do even to put in a small pamphlet and send it around among the medical inspectors (there are but a few of them in the State) for distribution among two or three, or four, or a dozen of our friends, in our respective towns. It ought to reach the people.

It seems to me we ought, in some way, to interest the press in this matter; we have newspapers printed in all our villages and towns in Pennsylvania, of any size--even our village has a newspaper— If we had even an epitome of this address printed in our newspapers, these thoughts would get into the minds of the people and they would be gradually educated up to an understanding of the subject.

Now, I have not the authority to say what this Board of Health in Pennsylvania, of which I am a part, as a medical inspector, ought to do in this case. But it just occurs to me to suggest to this convention, that to read these papers annually and put them in our published reports, or even in pamphlets, is not just the thing that we need. It seems to me, that the hundreds and the thousands of our citizens ought to know something about this; they ought to have an opportunity to read that paper from beginning to end, and we would all know something about the subject, and I believe that in the course of ten years we would be prepared to act.

Dr. MCCLELLAND. I think it ought to be in the papers.

Dr GROFF: I have not the slightest doubt that nearly every paper in the State of Pennsylvania, would be glad to publish that article if it

were sent to them with a notice and a request. Nearly all the papers I know, and I am acquainted with a good many of them, would do that very willingly.

The CHAIRMAN. Next we will have an address by Percy F. Smith, Esq., on the subject of Adulteration of Food and Drugs, whom I now have the pleasure of introducing to you.

19.—ADULTERATION OF FOOD AND DRUGS.

Mr. Chairman, Ladies and Gentlemen: The subject assigned to me is the Adulteration of Food and Drugs. Permit me to say here that in compiling this paper, I have relied mainly upon what I deem the best channels of information to-day in the country—the newspapers.

It is absolutely necessary that I should deliver this address to you to-night, because one of our somewhat enterprising papers this afternoon announced I had already delivered it, and I would rather lose ten dollars than disappoint the newspapers.

Statistics show that the average cost of food per week for an individual in the United States, is *only one dollar and sixty cents.* It would be natural to suppose, therefore, that every manufacturer of food products in our country would honestly endeavor to provide for the masses *pure* and nothing but pure food. Added to cheapness there is not another nation in the world that produces such a variety from which to select, and to this fact may be attributed, perhaps, the largest amount of adulteration.

At the outset however, I wish to remark that the reports of adulteration in food products are greatly exaggerated. For instance; it is not true that oleomargarine is made of defunct canines, felines, old gumshoes, tin cans, tooth brushes, tooth combs, etc.; nor is it true that all adulteration in food products are poisonous or necessarily hurtful, though it must be understood that I heartily denounce *all* adulterations. Aside from special articles such as condiments, or so called fruit jellies, coloring matter used in candies, syrups, water, etc.; adulteration of food is not largely a sanitary question. In these there is danger; in other articles it is purely a commercial question. The most prominent adulteration is the use of salicylic acid as a preservative, which according to the best information at hand, has been prohibited in both Germany and France, and ought to be in America.

Exaggerations exist in every trade and profession—even in the ministry—for it is recorded that a dominie given to stretching the truth, when rebuked for it, penitently said, "he shed bushels of tears over his misfortune."

These exaggerated reports may also be compared to the complaining drummer on the train, who said to the conductor, "when you get ready

to clean the drugs and chemicals out of that water cooler let me know, perhaps I can buy half a ton of copperas at wholesale."

The adulteration of food and drugs may be classed under two heads, viz: Those purely of a commercial character, and those that endanger health. The former has been defined as a sin against the *pockets* of the, people—the latter a crime pure and simple, *against the people*. There is is a diversity of opinion as to how such offenders should be punished, which I might notice here.

Dr. Newton, of New Jersey, says "State laws and the education of the people are the best methods to control this wrong of adulteration." But this position is strongly controverted, and it is contended that the remedy lies with congress; that adulterations, harmful or otherwise, will go on until the National Legislature interferes and forbids the importation of debased and impure food, and also prohibits their manufacture in this country.

The adherents of the State management theory argue that the Govern ment hasn't any jurisdiction in the matter over the States, and assert that relief can only be had through the state boards of health exercising police powers.

I think I should say in passing that while I heartily favor the control of this matter to the state boards of health the oleomargarine law and the inter-state commerce law pretty effectually settle the question of the jurisdiction of the United States Government over the States. Indeed, I may also say that at each session of Congress for the past three or four years, legislation has been introduced to prohibit the importation of impure and debased food, but an examination of the measures show conclusively that they do not fully compass the evil, and the additional legislation, namely, by the States, is absolutely necessary to correct the villiany of adulteration.

Arguing against the question of jurisdiction is about on a par with the distinguished gentleman behind the prison bars? His lawyer said to him, "But I tell you they can't put you in jail for such a thing". "But, blank it," said the prisioner, "I am in jail all the same."

What we want is a stringent law of the United States, to be supplemented by a State law, state and local boards of health with police powers, an inspector or analyst in every congressional district, and the co-operation of honest manufactures, to rigidly enforce the laws relating to adulteration, no matter in what form it may exist.

The greatest danger to the health of the people in the way of impure food comes from the sale of adulteration and impure milk, and I shall merely quote from other authorities further along, to substantiate this allegation.

The quantity of food products now being placed in the markets all over the country, is attracting more attention than at any other period in our history, and while we mention those which are fraudulent in their

character, commercially, we should look carefully into those which are positively dangerous, so that we may intelligently consider what moral responsibility rests upon us.

Hon. Erasmus Brooks, a member of the State Board of Health, of New York, says, "The adulteration of drugs upon the proper use of which depend health and life, demands the attention of health authorities and of all in any way interested commercially or otherwise, in their perscription or use". "Of three hundred and seventeen samples (of medicinal chemicals) examined by Professor Chandler and his Assistants in New York, only eleven were found to be adulterated; of two hundred and thirty-two samples of vegetable drugs, examined eighty-five either did not come up to the regulated standard or were plainly adulterated. And of one hundred and ten specimens of powdered drugs, such as ipecac, jalap, arris root, rhubarb and mustard, forty-six either in purity or strength failed to meet the required standard. Powdered drugs as a rule have proved the least reliable and satisfactory."

On oils Mr. Brooks, says, "Most kinds of oils are adulterated more or less—olive oil in particular."

J. Cheston Morris, M. D., of Philadelphia, says, "I think that we may fairly conclude that of the deaths under five years of age in our large cities, at least one-fifth are directly traceable to the inferior milk supply, if indeed this is not too low an estimate."

Then in behalf of helpless infancy let us have stringent laws and boards of health and power to enforce that law.

I notice the Minnesota legislature has passed a law requiring all dealers in milk to take out a license and give a bond, the State dairy commissioner having full charge of the matter, and while it does seem severe such legislation appears to be necessary.

Then in behalf of helpless infancy let us have stringent laws, and boards of health empowered to enforce said laws.

Medical experts have pronounced saccharine, the recently discovered product, said to be many times sweeter than sugar, extremely unhealthful. They say that it is not an article of food, and cannot replace sugar: that it is productive of dyspepsia, having an injurious influence on digestion, and that being unhealthful its use should be prohibited in all articles of food intended for human consumption.

It is Dr. Newton, of New Jersey, who says, that most forms of adulteration are sins against the pocket, but occasionally the adulterants are poisonous, either immediately or after continued use. He instances salicylic acid, and thinks that the damage to health by impure food is a greater evil than the fraud. Both are heinous.

In Europe and in this country also, poisonous or sick cheese has received considerable attention, and in an adjoining county in this state, the records show one or two deaths from the eating of poisonous cheese.

Professor Vaughan, of Ann Harbor, Michigan, referring to cheese,

says: "I think that it can be positively stated, that any cheese which will instantly and intensely redden blue litmus paper should not be eaten. This is a test easy of application, and every merchant on cutting a fresh cheese, should make it. If the cheese is dry, a bit of it should be moistened in water, and to the litmus paper then applied."

Among hygienic facts generally recognized, there is probably none better established than that disease and misery among the poor is due to a lack of variety and insufficiency of food. Investigations show that it is in small packages that the greatest amount of adulteration is found. These facts reveal the dark picture of the poor purchasing with their limited means, food products from which have been extracted the most nourishing principle, as small packages for small sums of money, are alone within the reach of these people.

Ignorance of the existence of a law in our state does not excuse the offender; nor will ignorance of the poison that may be in food relieve dealers of responsibility, unless they demand reasonable precaution. A reasonable precaution, to my mind, would be to use efforts to aid the legally constituted boards of health in the discharge of their official duties.

It is everywhere acknowledged that the state is the guardian of public health, and this concession should settle the question as to who should be empowered to enforce health laws, viz: the state and local boards of health.

If enough money can be appropriated for the purpose, and if manufacturers, wholesalers and retailers, combine their forces, and co-operate with the state boards of health, the sale of adulterated food will cease.

European countries and some of our own states have laws for the inspection of food products, and a public chemist with assistants. Our state is far behind in this matter. If any of you were here this morning you know why this is: Massachusetts appropriates $111,000 for the use of her board of health, while Pennsylvania appropriates $5000; that is the reason the State of Pennsylvania is so far behind. There should be analyists in each congressional district. Dealers in impure food products have little to fear where there is no public chemist.

Congress has enacted laws closing our ports to contagious diseases, but has left them open to impure and adulterated food of every kind. It is to be hoped that stringent laws will soon be enacted for the whole country, not only prohibiting importation, but the manufacture of impure and debase food. State laws will follow, and it will soon be discovered whether the governments, national and state, cannot control this slowly increasing evil. Whether the United States Government does it or not, I feel sure the states will, through their boards of health. As I have already remarked, a hearty co-operation can be given in this direction, by honest manufacturers, wholesalers and retailers, and finally by the consumers. But moral suasion alone will not abate the

heartless evil; laws, and their enforcement, are required to eradicate the villany.

Moral suasion in this matter, would be about as effective as in the case of the Irishman, who, finding a large beer glass on a bar, unnoticed by the bar-keeper, filled it to the brim with whiskey. Just as he put it to his lips the excited bar-tender noticed the draught, and cried out, "man, man, don't drink that all at once—it will kill you; it isn't cider; it isn't cider." But Pat was not to be moved by moral suasion, and swallowing the poison, remarked disdainfully, "cider, cider did you say, I wouldn't put that much cider in my stomach for $10." Moral suasion will not reach unscrupulous manufacturers such as it is claimed they have up in Michigan. A gentleman in my hearing related this incident about the aforesaid wolverine state manufacturer:

"There is not one per cent. of the genuine article in the pepper in Michigan, and the way I know it is this: I put ten pounds of the pepper in ten pounds of sausage meat, and experts were totally unable to discover the presence of pepper in that meat." The statement evoked considerable merriment when the gentleman said: "We have it on record, that pepper in this State (Michigan) has been adulterated 99 per cent., but the case I am hinting at beats the record." Other stories of pepper have been related to me until I am in grave doubt whether the public wants pure peppers. This doubtful state can only be removed by laws requiring these goods to be commercially pure.

I might say, however, in passing that the doubtful state might be overcome as it was in the case of Brown, before the last presidential election. His small boy annoyed him greatly by asking him what was the doubtful state. He at length replied, "Matrimony is a doubtful state my son. A'n't it Mrs. Brown?" She quickly replied, "To me, it has never been a state at all. It has always been a terror-tory."

Eminent persons writing upon the question of pure food, disclose some similar things.

For instance: A citizen of Michigan discovered in France and Italy, cotton seed oil in casks from America, and inquiry showed it was used with olive oil to make *pure* olive oil for export to the United States. No secret was made of this fact. The residue of the mixture is used over there for butter.

I append a few statistics showing adulterations discovered by analysis in food supplies. Ground coffee, 45 per cent.; spices, 66 per cent.: low grades of sugar, 20 per cent.; teas, 48 per cent.: syrup, 50 per cent.; milk (when not inspected,) 50 per cent.; cream tartar, 44 per cent.: baking powder, 44 per cent.; bread, 2 per cent.

It will thus be seen that while the above adulterations are entirely of a commercial character, they are nevertheless fraudulent and open the door for the more unscrupulous manufacturers to still further adulterate and not only so, but to introduce poisonous substances to enrich their

coffers when they can do it without fear of detection or punishment. But even where the ingredients are not poisonous the State should enact laws to check the frauds, and give long life to our people; for it must be admitted that buckwheat bran, terra alba, or white clay, alum, turmeric for coloring, musty flour, middlings, alum shucks, chickory and starch will not produce longevity. So far as clay is concerned it is not yet settled that an ostrich can digest it.

There is nothing nutritious in turmeric or rejected flour, and it is absolutely wrong, nay more, it is a crime, to permit their use for commercial purposes.

Here is what a learned gentleman says of these adulterations: "Rice hulls, oat hulls, etc., are woody fiber, not fit for an animals stomach and sickness and death is what adulterations of this character will really mean."

The demand of the consumer for gifts with goods, which is growing steadily, as the result of a desire of the masses to get something for nothing, has lead to the production of handsomely labled can goods, such as oysters, peas, corn, etc., which, if they do not contain poison are absolutely worthless as wholesome food. The quality of the food deteriorates in proportion to the alleged (?) value of the gift, and you may conclude this, that if you buy fifty dollars worth of spices and receive a fifty dollar music box with the goods, you have fifty dollars worth of cracker meal and a wheezy music box. Whole spices can't be ground and sold for five or six cents per pound less than the unground goods cost, and a music box furnished the dealer for the privilege of grinding, and as the amendments of the inter-state commerce law make it an offence for a shipper to conive at lower rates than the published tariff, in like manner, to thoroughly correct this evil, we should have a law to punish all who ask for fraudlent goods.

A gentleman in Philadelphia, who was once a manufacturer of spices, told me that he once had an excellent run on a special grade of black pepper, which was composed of the following ingredients: Red African pepper five pounds; black pepper ten pounds: pulverized water crackers, eighty-five pounds; total number of pounds of No. 1 black pepper, when mixed one hundred.

In proof of this another manufacturer says that at the close of the war, thousands of pounds of "hard tack" passed from the hands of the governments to the spice manufacturers, and under their skillful hands was metamorphosed into pepper.

Clifford Richardson, one of the United States Analysists, says, spices and condiments for human food are adulterated to a great extent, but only in a commercial sense. He says: "Of twenty samples of ground cloves examined only two were pure; of cayenne pepper one out of eight: and of mustard, ten were examined but none were pure.

Coloring matter is used in cheese, says another authority, for the

purpose of simulating richness, while in point of fact it damages the article. Indeed, it is a question whether or not the ingredients are not actually poisonous. In proof of this may be cited the fatal poisoning in Beaver county. It was only because of the fact that the state has no chemist, and the board of health no power, that this terrible affair was not inquired into.

The fatal cases in Philadelphia from eating poisoned buns, about a year ago, for a time stirred up great indignation, but were lost sight of. It would not have been so had the state had a chemist, and a board of health vested with power to punish the scoundrels who send death into families in the shape of poisoned food products.

In Philadelphia too, last year, through the efforts of the efficient agent of the Retail Grocers Association an Italian peddler was run down while furnishing poor children with rotten bananas.

The fruit was sold to the little unfortunates at two for a penny, and was not only rotten but alive with worms. He was fined for peddling without a license and his occupation broken up. But what a parody on justice! what a shame on our boasted civilization! Had his just deserts been meted to him he would now languish behind prison bars.

This inordinate greed for gain which gives birth to the fearful habit of selling impure, debased and adulterated food in any and every way, must be legislated upon, and the practice once and forever prohibited under extreme penalties.

We have an old scotchman up in McKeesport who ran a dairy, and ran it honestly, but he quit the business. He told me the reason he went out of business that because a Yankee came into town and started up an opposition dairy; the Yankee had a fine new wagon, and on the wagon was painted a large pump, and, "Spring Hill Dairy," or something like that, and so my friend went out of the business.

I am glad that the dignity of the human stomach is begining to be recognized and it will become a leading topic as soon as the better class of our citizens realize what a crime is being wrought upon the poor, in the form of spurious, unwholesome and debased food.

State laws should be enacted to prevent substitutes being sold as standard goods.

To prevent unwholesome, worthless or debasing substitutes being used to increase weight or bulk without adding to the value of the compound, unless they are so labeled, and to prohibit absolutely the use of poisonous substances in food products.

And such legislation, enforced by the state boards of health, will secure to the people good, pure, wholesome, cheap and nutritious food.

The CHAIRMAN. This paper is now open for discussion.

Prof. LEFFMAN: Mr. Chairman: It is very natural of course that at this distance from Philadelphia there might be some mistake in the record of the fact, and I therefore think it proper to remark, that the,

Bun poisoning cases have not fallen so flat, or without moral to the community, as might be inferred from the remarks of the reader.

The three bakers—or two bakers and one kneader—who were guilty of putting chrome yellow into buns were all sent to jail for the longest term permitted by the law, and also fined.

The result of the investigation has been, that the practice of using chrome yellow has been entirely stopped I think in Philadelphia. Numerous cases of supposed use of chrome yellow have been brought to me since, but I have never been able to find any trace of the article being used.

I have the matter more particularly in my mind from the fact that I made nearly all the post mortems and chemical examinations of those poisoned for the State and the investigators.

I would like also to say, in reference to the question of food adulteration, that I think our great road out of the difficulty would be to compel all those persons who manufacture package foods—foods which appear in sealed or closed receptacles—which are sold under trade titles, to affix to those packages a statement of the character of the food, and to hold them responsible for the correctness of that statement.

Now, I have often said in discussing this question, that we feed the plants in Pennsylvania with more care than we feed our population. No article of fertilizer can be sold in this State unless the package, bag, or other receptacle contains, clearly stated, the results of analysis of the composition of that article, and heavy fines are imposed for erroneous analyses, and a very stringent system is in operation to secure continual supervision in this matter.

The same thing, it seems to me, should be employed with reference to articles of food. If adulterations, or dilutions are at all to be permitted, they ought to be permitted with perfect publicity. The English government has legislated on this subject, I think with tolerable success. They permit the sale of mixed articles of food, such as chickory with coffee, starch with mustard, and other articles, but they require the package shall contain a statement as to the admixture, as well as the name of the manufacturer. Coleman's mustard, a well known English mustard, is, I believe, always adulterated as it comes to this country. I have never failed to find starch in it by the simplest tests, and yet it comes unmarked by any distinct feature; but the same brand is sold in England with a distinct statement that it is not pure mustard. In the same way with package coffees, or any articles of that kind, they are very frequently mixed with adulterations of some kind, but they don't bear any evidences of that fact on the package.

So also with the use of preserves, now becoming so frequent. I think if they are to be used at all (and I have no doubt about the advisability of using them) they ought to be sold with a public statement on each package.

If salicylic acid is used in beer the brewer ought to be made to so brand it. If it is to be used in catsup or any other article in which it is not infrequently found, it should be so stated on the package.

Then, I think we at least have a fair condition of things before the public. Those who are willing to use the articles so diluted, will at least not be deceived as to the condition of affairs; while those who, I think, more wisely avoid such articles, will be provided with the means of protecting themselves.

The hide and seek method of food examination, which has been so long resorted to, of having official chemists hunt up the articles adulterated seems to me to be simply a useless method. I believe the community has a right to insist that every man who makes or prepares an article intended to enter the stomachs of human beings, either as food, drink or drug, ought to make it under official supervision, and under such conditions, that the thing he sells shall be clearly indicated.

This, it seems to me, is not an impractical plan, and one that would result in very great benefit in many directions.

On motion adjourned.

PITTSBURG, PA., *June 1st*, 1889.

Convention called to order by Doctor Lee, moving that the Hon. Charles Moore, of Montgomery county, be elected temporary chairman, which motion being. duly seconded and carried, Mr. Moore took the chair.

The CHAIRMAN. The next paper on the program is, Small pox in Nanticoke, by Louis H. Taylor, M. D. of Wilkes-Barre.

Dr. LEE. I would state Mr. Chairman, that the gentlemen who are put down for papers to day, coming from a distance, have probably all been cut off by the terrible calamities which have occurred on the railroad. I have a telegraph from Dr. Risley, of Philadelphia, stating that communication is cut off from that city to Pittsburgh, and that he will not be able to be with us; and I fear that will be the case with these other gentlemen.

The CHAIRMAN. The next paper is, Railroad Sanitation, by Dr. Joseph F. Edwards, of Philadephia.

Doctor EDWARDS. My idea of sanitation is always a practical one, and it has occurred to me that we might borrow a lesson from this terrible accident, or dispensation of Divine Providence, as some people may call it, that has occurred.

The papers tell us that a thousand lives have been lost by this washout on the Pennsylvania Railroad. Doctor Baker tells me that they annually lose two thousand people in Michigan, by diphtheria. I suppose in Pennsylvania, Doctor Lee would support me, if I was to say we lose from fifteen hundred to two thousand.

Doctor LEE. I do.

Doctor EDWARDS. But here when we have a thing of this kind, the

Pittsburgh papers come out with this tremendous notice. If Dr. Piper was here this morning, I would like to suggest to him and to his Maryland Board of Health, that they should make sanitary reform a sensational matter. Instead of appealing to the people and to the authorities, to give us sanitary legislation as something that we ought to have, let us try an appeal to them from the sensational standpoint; I think we will get it. That just occurred to me this morning. I am chairman of the committee on the Supervision of Travel and Traffic of the State Board of Health, and in that connection I have been in correspondence with the principal railroads of the state, and I am going to give you this morning, an abstract from my Report to the State Board of Health.

21.—RAILWAY SANITATION.

By JOSEPH F. EDWARDS, M. D.

The fact that so many persons annually pass so very much time in railway cars, added to the fact that such an enormous proportion of the population of our State is engaged in the railway business, would make it seem that it might prove a not uninteresting, nor unimportant task, to ask what provisions have been made by our railroad authorities for the preservation of the health of those whom they employ, and of those whom they transport. We will not go far wrong if we assert that 100,000 men are employed by the railways operating in this State. Assuming the population of the State to be 5,000,000, and allowing for each family five persons, we have 1,000,000 families, so that remarkable as it may seem at the first blush, it would appear that one man out of every ten living in this State is employed in the railroad business. If this assumption be any way near correct, we can readily comprehend what an important significance "Railway Sanitation" should assume. In seeking information relative to this subject, I have been particularly impressed with the fact that our great railroad corporations seem thoroughly alive to the importance of the questions involved; my inquiries have been, everywhere, received with the greatest cordiality, and I have been assured that it is the desire of these corporations to thoroughly and heartily co-operate with us.

Let us first look into the question of how the railway companies guard the health of employés?

It must be conceded by all who have given thought to the subject, and we are glad to say that it seems to be so conceded by our railroad companies, that the better care they take of their men, the better and greater will be the amount of work secured in return. The day has gone by when quantity of work done was the first criterion of a laborer's value; now quality comes first, and quantity is really a secondary consideration.

Our railroads seem now to thoroughly understand that a man who is over-worked cannot do good work, for I have been not only gratified, but surprised as well, as I am sure those who hear me will also be, to learn that no railroad employé is obliged to work more than twelve hours out of the twenty-four. Had I received this information from any other source than that from which it has been derived, I would have been tempted to doubt its accuracy, for we have all been accustomed to regard railroad employés as a terribly over-worked class. I am especially glad to be able to dispel this illusion, for my information is all official, and we can therefore dismiss this question of over-work, by resting assured that the railroad employés of Pennsylvania are not an over-worked class. But while we find that the men are not over-worked, we do find it necessary to suggest that if it be at all possible, their work should be so arranged that they could have their meals at regular hours. We are informed that this is done with all employès except train-men, whose irregular hours of service at times preclude regular meal times. Nothing is more provocative of indigestion than irregularity in this respect, and nothing is more fatal to health and efficiency than indigestion. Hence, I would like to suggest, that, if it be possible, regularity in this important matter is a great desideratum.

I was particularly anxious to learn whether the fear of loss of position existed as a spur to urge a man to work when he was physicaly unfit for labor, and I am glad to be able to state that when an employé reports sick he is excused from work, his position is retained and restored to him upon recovery, and if he is a member of the relief association he is reported for benefits. It would seem to me well to suggest to our railroad corporations that a physical examination of applicants for position, just as in the army and navy, and in our police and fire service would be an addition to their already excellent systems. They would thus secure a picked set of men, who would be less liable to call upon the relief associations, and who would be all the better able to perform the work required of them. Such examinations are now required for admission to the relief associations, but are not exacted of applicants for positions on the railroads.

As we notice freight trains passing along, our attention is called to the little red caboose at the end of the train, and I have wondered whether it was not a foul little place to be occupied, as I supposed it was, by a considerable number of men. I am glad to say that I was wrong. The Pennsylvania railroad informs me that the train-men take considerable pride in keeping their cabooses clean; these cars contain about 2,000 cubic feet of space, and are occupied each by six men; the train in motion would cause such a current of air as to give an ample amount of fresh air for each occupant. The Reading railroad tells me that on their road these cars are not used for sleeping purposes.

Do railroad employés suffer from any disease special to their occupation?

On this subject I am informed that statistics are not sufficiently exhaustive to warrant an opinion, but I am led also to understand that engineers and firemen are particularly liable to suffer from diseases due to a disturbance of the equilibrium of the circulation, caused by the fact that one-half of the body, (that nearest the boiler) becomes greatly over-heated, while the other half (that nearest the window) is very decidely cooler, and as, with the engineer, (who sits on the right) the left side of the body approaches most closely to the boiler, I would not be surprised to learn that distention of the heart might possibly be a condition somewhat more common to them.

Conductors and brakemen, I learn, are somewhat inclined to rheumatic affections, more especially in summer, when, after leaving a warm car, they stand on the platforms, exposed to the strong draughts created by the moving train, and it has been suggested that, with this danger in view, it would be well if the summer uniform of these men comprised a coat that could be, and regulations that would require it to be, buttoned up all the time the men are on duty.

It would seem, in dismissing this part of the subject, that there is very little to be desired from a sanitary point of view in the relation of employer and employé so far as our railroads are concerned. The employer exacts little or nothing from the employé that is, or can be, prejudicial to his health, and it offers him, with the very trifling suggestions made, every facility for doing his work in a way that need not, and will not, conflict with his first duty to himself and to his family, namely, the preservation of his health.

That such is the fact, points a very strong moral. When we can get the people to believe, not because we tell them, but because they realize, that hygienic lives mean successful lives; when they come to under stand that sanitation, far from necessitating an unpleasant and objectionable asceticism, far from causing us to be deprived of the real, rational pleasures of life, far from interfering with our material, realistic, worldly success, on the contrary, is the greatest of all possible adjuvants thereto, then will they come to look upon the subject in its proper light. That our great railroad corporations; organizations, that. for their successful existence must of necessity receive the very best labor of their employés, organizations that are usually in the very front ranks of human material progress; that they should deem sanitation a subject worthy of their careful consideration and practical recognition, strikes me as a very forcible reminder of the living reality of hygiene.

From a business point of view, railroads do nothing that is not pecuniarily profitable, and, since sanitary regulations form important parts of their systems, we are forced to the conclusion that "*hygiene must pay.*"

So much for the employés: let us see what protections to health the railroad companies provide for their patrons; the traveling public.

In the matter of ventilation and heating of passenger cars, I find that our railroads are fully alive to the importance of the subject, and that the best known means of ventilation are in use. But I also find that the best known means are extremely unsatisfactory. I am sorry to say that while, in this matter, I am constrained to find fault, I am, unfortunately not prepared to suggest the remedy. It is a matter of common observation that our passenger cars are either extremely hot or unpleasantly cold, and it is a comparatively rare event to find an even, comfortable temperature unless it be due to the equability of the outside temperature. The heating and ventilation of passenger cars is a problem not yet satisfactorily solved, (unless the recent introduction of steam may settle the point of heating) though we can rest assured that the railroad companies are eagerly anxious to avail themselves of any and all suggestions on the subject. They are wisely conservative, in so far that they will not hastily adopt any innovations, but, when thoroughl satisfied of the practical utility of any suggestion they cordially adopt it at once.

Particularly is the need of better ventilation made manifest in sleeping cars. The comfort, convenience and practical utility of sleeping cars cannot be over-estimated, but their influence on health is not good and will not be until they are better ventilated. We would impress the fact that this lack of ventilation is no fault of the officails, who have supplied the best known system, but it is because this best known system is not satisfactory. I have frequently heard men remark that the only time they feel drawn towards liquor in traveling is after they have passed a night in a sleeping car; this it would seem might be explained as because of the depressing effect of an impure atmosphere on the system, making itself manifest by the call for an artifical stimulant.

While on the subject of sleeping cars, I would say that the measures to ensure cleanliness of bed-clothing are, with one single exception, all that could be desired. Linen is never used a second time without being washed and the blankets and mattresses are thoroughly aired at the end of each trip. The exception referred to is as follows: It is not imaginary danger to suppose that a berth in a sleeping car may be occupied by some one who may have a disease characterized by a contagious discharge, such, for instance as purulent ophthalmia, or some similar affection, and that some of this matter drying on a sheet and not being thoroughly removed by an ordinary washing may be the means of conveying the disease to the next or some subsequent person who uses this sheet. When we consider how promiscuous are the occupants of these berths, we have no right to say that this is not a real danger. For a remedy I would suggest, that before washing, this linen be all rinsed out in a solution of corrosive sublimate.

As for the cleaning of passenger cars I am informed that they are cleaned daily when in use, a large force of men and women being specially employed for this purpose, and, from personal obseravtion, I believe that this work is well done, save on some of the smaller branch roads, where more attention to cleanliness of passenger cars is desirable.

The urinals and closets in cars are generally kept satisfactorily cleaned, but as they are at present they are eminently unsatisfactory. It would be difficult of accomplishment, but extremely interesting could we definitely ascertain how many cases of disease have been produced by the pollution of streams from the deposit of some passenger on an express train traversing our State at the rate of forty miles an hour. It is not necessary that these deposts should drop directly into a stream they may fall on the road-bed and from there be washed by subsequent rains into a run, that may furnish the water supply of a village. It is not a flight of fancy to suppose that some of those mysterious outbreaks of typhoid fever in villages may be caused in this way. Fortunately, in this case, I think I can suggest a remedy, which will be taken up in connection with the question of closets in stations.

For urinals, the Pennsylvania Railroad, some years ago adopted a standard disinfectant, consisting of chlorides of copper and zinc and bichloride of mercury. This is used at stated intervals in all urinals and closets and other places where sanitary rules demand. In hot weather a lump of ice is placed in the urinals and this same practice we have seen to be in use on the Reading road; this road also uses disinfectants in the urinals.

I have been informed that the problem of closets at stations is, as yet, not satisfactorily solved, though it is incumbent upon the station masters to see that these closets (such as they are) are kept clean and in proper condition. On the Reading system traveling inspectors are constantly looking after the sanitary condition of the stations including closets, while on the Pennsylvania system, inspections are made periodically by superintendents and the assistant train masters, by the latter, at least once each month. I am constrained, however, to believe, that the sanitary conditions of many stations is not what it should be. I have reached this belief from personal observation of one suburban station that may be regarded as a prototype of or possibly an improvement on many others, since it is one of the fashionable suburban stations in the vicinity of Philadelphia.

At the location in question the track is elevated, so that there is a basement to the station house, in which more or less rubbish and a quan tity of coal oil is found; there are two windows in the basement, but as I never saw them opened (until after I had so suggested), the damp and more or less foul atmosphere therein contained, had only one means of egress, and this was to be sucked up through the floor into the wait-

ing room above by the warmer atmosphere there existing, and that it did so ascend was practically demonstrated by the failing health of every master who ever had charge of this particular station. The closets at this station were on the ground (at the foot of a steep flight of steps) and close to the station; so that I have, more than once been perceptibly reminded of the proximity of these closets by the odor that arose therefrom to be disseminated throughout the waiting room. There was an overflow pipe from these closets emptying into a small stream that meandered away through meadows wherein the neighboring farmers were wont to pasture their cattle. Certainly not an ideal condition of affairs, yet it is hardly fair to assume that this is a solitary instance. But for the remedy. To avoid repetition I would here refer to the article on "A New Departure in The Disposal of Sewage," on page 177 of "The Annals of Hygiene," for last April. A modification of this system, it has occurred to me might be available for use in trains and it could certainly be advantageously used at stations.

It is wise policy only to make suggestions that are practicable, and while it would be ideally correct to suggest that corps of trained inspectors should be employed by all of our railroads, yet such an addition to the force of employés would be a great expense, and the same result can I think be attained in a much simpler, less cumbersome, and less expensive way. I would respectfully suggest that the management of our railroads should make it necessary for all of their employés to inform themselves of the elementary principles of hygiene and then each man is qualified to, and can be made act as an inspector in his particular locality.

It cannot be questioned that from a walking case of small-pox, or of diphtheria, or of typhoid, or, indeed, of any disease the most virulent from of the disease may be contracted; therefore it is of interest to learn that any officer or agent of the railroad companies has the authority to refuse transportation to a suspected case of contagious disease.

As to the transportation of the sick, we learn that special cars are provided for their transportation, upon application and the payment of fixed amounts and the Pennsylvania Railroad, will, in special cases, detail one of its medical corps to accompany the sick person. Dead bodies will not be received by the Reading road, for transportation, without a certificate from the Board of Health, or from a physician, that they are free from contagion, and the corpse must be securely enclosed in a box or casket, and the same rule is in force on the Pennsylvania.

Having considered the position of the employé and the passenger, we come to the transportation of cattle, and we here learn that, by rule, cattle must be properly fed and watered en route, and that at the end of each trip, the cars in which they have been transported must be thoroughly cleansed.

We find that on the Pennsylvania road a box is furnished to each engine and station, containing bandages, rubber tubes for tourinquet, lint and plaster. At some stations in cities additional materials are furnished, and one person instructed at each place to apply the same, while, on the Reading system we learn that such outfits are kept at such convenient stations or points as to be readily available when required.

Here then we have briefly reviewed the question of "Railway Sanitation," and our investigation has been a most satisfactory one. I am confident that it would be impossible to enter a field wherein there would be found more to praise and less to criticise, and we feel sure that the few suggestions herein made will be warmly welcomed, and, if, upon mature reflection, they are deemed worthy, will be favorably acted upon. Warmly should we congratulate the great Railroads of this State for the advanced position of sanitation that they have assumed, and strongly should we urge the imitation of their excellent example by all employers of large numbers of employés. I cannot close this short report without acknowledging in the most emphatic way the extreme courtesy displayed by all the railroad officials with whom my investigations have brought me in contact, and, in an especial manner am I indebted to the kindness and polite attention of Mr. H. Stanley Goodwin, General Superintendent of the Lehigh Valley; to Messrs. I. E. Sweigard and A. A. McLeod, of the Reading, and to Dr. Samuel W. Latta and his brother W. J. Latta of the Pennsylvania systems.

Since the inquiries were made that are embodied in the preceding report, I am deeply gratified to learn that most excellent sanitary regulations, in addition to those already in force, have been issued by both the Philadelphia and Reading, and the Pennsylvania Railroads. So admirable are these regulations that we append the circulars in full:—

THE PHILADELPHIA AND READING R. R. CO.
GENERAL OFFICE,
227 SOUTH FOURTH STREET.

The attention of all officers and employés is directed to the following regulations, in regard to disinfection and the prevntion of the disease—

All these stations, yards, shops and adjacent grounds, as well as the line of road in general, must be kept absolutely clean and free from decaying animal or vegetable matter and from rubbish of every kind. Especial care must be taken to remove offensive odors and to destroy disease germs where these are believed to exist, and for this purpose, disinfectants must be freely used wherever necessary. The floor and seats of privies, and the floors, urinals and hoppers of closets in passenger cars, must be thoroughly scrubbed once a week, or as much oftener as may be necessary. A suitable quantity of proper disinfecting material must be kept in urinals at stations, and in those of passenger cars when in service.

Passenger cars must be carefully ventilated, and the paint, glass and upholstery kept neat and clean. The floors of stock and other freight

cars must be cleaned immediately after the cars are discharged, and the refuse must be burned, if it cannot be otherwise disposed of.

Great care must be exercised to prevent the pollution of water which is used for drinking and household purposes. Privies, stables and sewers must never be so located, that the drainage from them finds its way into the water supply. If it becomes necessary to use water which is suspected of being dangerously impure, it should be boiled and allowed to cool and settle, before it is used.

All drains and sewers on the Company's premises must be thoroughly flushed with clean water once a week, if the water supply will admit.

Privy wells must be made at least five feet deep and the contents must never be allowed to accumulate within three feet of the surface. In disinfecting wells sulphate of copper, commonly called blue-stone, or sulphate of iron, known as copperas, may be used to advantage in a dry state, care being taken that the disinfectant reaches all parts of the well.

When a case of infectious disease is found in a passenger car, or at a station, a physician should be called at once. The car must be removed from the train without delay, and it must not again be placed in service until it shall have been thoroughly cleansed and fumigated. Such articles as clothing, bed linen, &c., which may require disinfection, should be boiled in water for at least half an hour.

Division Superintendents will be held personally responsible for the enforcement of these rules, and to that end, they must provide for thorough and systematic inspection of the property under their charge.

A. A. McLEOD,
Vice-President and General Manager.

PENNSYLVANIA RAILROAD COMPANY.—*Philadelphia, Wilmington & Baltimore Railroad. Northern Central Railway. Baltimore & Potomac Railroad. Alexandria & Fredericksburg Railway. Alexandria & Washington Railroad. West Jersey Railroad. Camden & Atlantic Railroad. Camden & Philadelphia Steamboat Ferry Company. West Jersey Ferry Company.*

Circular in Regard to Disinfection.

The efficiency of the service depending largely on the health of the employés, the attention of all is called to the following points, in regard to disinfection, and general preventive measures against disease.

Cleanliness.

One of the most important means of preventing disease is cleanliness, not only of the body, but also of surroundings. No disinfectant or medicine can take its place. The following rules must be observed:

I. All shops, stations, and adjacent grounds, as well as the track between stations, must be kept scrupulously clean. Decaying animal or vegetable matter, and rubbish of every kind must be burned,

II. The floors and seats of privies everywhere must be scrubbed with soap and water not less than once in two weeks, and the vaults emptied whenever the material accumulates to within three feet of the surface of the ground. In no case should a privy vault be less than five feet deep.

III. Drains and sewers must be flushed with fresh water as often as once a week, if the water supply will admit.

IV. Passenger cars must be thoroughly ventilated, and the plush beaten frequently. The paint and glass must be washed at least once in two weeks.

V. The closets of passenger cars, especially the floor, urinal, and hopper, must be washed at least once a week with "P. R. R. disinfectant," according to the directions given.

VI. Freight cars at stations must be cleaned before leaving the station, and if the refuse from these cars cannot be satisfactorily disposed of otherwise, it must be burned.

Water Supply.

Too great care cannot be exercised in keeping the water supply used for drinking and household purposes free from contamination, impure water being one of the most effective mean of spreading disease. The following points should be observed:

I Privies and stables, and outlets of drains and sewers, are frequently so located that the drainage therefrom finds its way readily into the water supply. This should never be.

II. As a rule it is better to take water supply from rapidly running streams than from any other source, and always some distance above the nearest contamination. Springs, where the high land surrounding them is free from impure drainage are excellent sources of water supply Wells, especially those near dwellings, should be avoided.

III. In all cases where a water suspected of contamination must be used for drinking, or as a constituent of food, such water should be boiled and then allowed to cool and settle before it is used. It is better not to add ice to the boiled water, as ice itself is frequently contaminated. Boiled water may be readily cooled by having it in a metal or earthen vessel, and after wrapping a wet towel around the vessel, placing it in a current of air, or by placing ice in contact with the vessel outside.

IV. Garbage and rubbish of all kinds near the water supply, must be burned or removed.

Disinfection.

The best disinfectant known is simply fire. Burn up everything in the shape of filth, and it will never cause further difficulty. In some cases however, this is impossible, and in such cases disinfectants and antiseptics are properly used, especiaally, [1] to remove offensive odors, [2] to render decaying organic matter which cannot be burned less dangerous, and [3] most important, to destroy disease germs. It is believed that the "P. R. R. Disinfectant" will accomplish each of these results. If it is properly used after filth and rubbish of all kinds have been burned or disposed of as directed above, offensive odors every where will be reduced to a minimum, and the danger of disease will be very greatly diminished.

I. This disinfectant must be used freely, and all persons in charge of shops, stations, cars, or any portion of the Company property, will be held strictly responsible that the property is as clean and free from odor as possible. P. R. R. Disinfectant is made under the supervision of the laboratory at Altoona, and may be obtained in boxes holding two dozen bottles by making requisition on Altoona shops. Directions for use accompany each bottle. For use where slight stain is objection-

able, a special form of P. R. R. Disinfectant is made which does not stain.

II. For disinfecting clothing, bed linen or other articles which have been contaminated, and which it is not desirable to burn, the best disinfectant is simply to boil in water for at least half an hour.

III. Sulphate of copper, or blue vitriol, also known as "blue stone," is a very valuable disinfectant. In damp places, in privy vaults, and in cesspools, it may be used freely in the dry form, being simply coarsely powdered and scattered around. In other places it should be dissolved in water before use, not less than one-half-pound to the gallon of water.

IV. Sulphate of iron, or copperas, is also valuable, especially as an antiseptic. It is much cheaper than sulphate of copper, and should be applied in the same way, and for the same purposes, except that two or three times as much should be used.

V. Ice is very valuable in preventing decomposition, and in this sense is a good antiseptic. It may be used with great advantage on passenger cars, and in the urinals of water closets at stations. In all cases where the supply will admit, a lump of ice must be kept in the urinal of every passenger car while the car is in service.

Infectious Diseases.

If at any time a case of infectious disease is found at a station, in a passenger car, or elsewhere on the Company's property, a physician should be immediately sent for. The car should be removed from the train as soon as practicable, the doors locked, and it should not again be used until it has been fumigated.

The foregoing has been approved by the Pennsylvanvia State Board of Health, and all employés are expected to heartily co-operate in the above measures for preventing disease, and they are earnestly recommended to apply them also at their own homes.

CHARLES E. PUGH,
General Manager.

Doctor LEE. I desire to move as a matter of courtesy, that the discussion of this paper be postponed until a paper which I will name has been read. The paper of Mr. Marvin was omitted yesterday in consequence of the lateness of the hour. Mr. Marvin, whose subject is Bread," and who is a bread maker on a large scale has been engaged the entire morning sending out supplies to the sufferers at Johnstown. He is very anxious to return to this humane work as early as possible, and I would therefore suggest that his paper be heard and then the discussion of the paper last read be listened to.

This motion being duly seconded was put by the Chairman and carried unanimously.

Mr. MARVIN. Mr. Chairman: The matter of bringing these samples of bread was not in my mind until one of the gentlemen this morning suggested that I would here cut a loaf of bread, and it occurred to me that possibly one of the best ways of giving you information on the subject of bread was to go to our place of business and bring some samples of bread that were not specially prepared for exhibition. They come out of the baking of last night, for I had not any idea of bring-

ing samples until the matter was to me suggested, and I believe the samples, and what I have to say to you concerning them, will be much more interesting to you than what I have written.

22.—BREAD.

Who has not partaken of bread? At once you answer, "Everybody eats bread." It is the staff of life. True, to us in this land of plenty, bread is the chief article of diet, but it is not so in every land. There are millions of the human race that do not know what it is. They never saw it and were you to present a nice, white loaf to one such person, he would ask you what it was. Yet there is not a country in the world where bread in some form cannot be found.

In lands where wheat flour is not known, or where the supply is small, bread is made from other seeds, from roots, pith of plants, the bark of trees, or even from dried flesh. As examples of this, we may mention the acorn, or horse-chestnut bread, potato, turnip, and manioc bread, the last being made from the roots of a poisonous plant that flourishes in the Carribee islands: sago bread, made from the pith of a tree; bark bread, made in northern Europe, from the bark of various trees, and the bread of the Laplanders, in which dried fish is used as a substitute for flour.

In China rice is the principal article of diet. It was so in India and Japan, until the western nations introduced wheat. To day the English are endeavoring to encourage the inhabitants of India to raise wheat and live more on bread, because it produces a stronger race of people. India wheat is no small competitor to the western farmer in the markets of the world. It now even effects the price of wheat at our own Atlantic seaboard, and is regularly quoted in the markets of Liverpool and London.

In Australia, wheat is one of the principal crops. Africa has begun the raising of wheat, and who will say but that ere long, she too, will be one of our strong competitors in the supply of bread to the millions of continental Europe.

But Bread is our subject. The baking of bread is of pre-historic origin. Excavations conducted on the site of some of the numerous Lake dwellings in Switzerland have resulted in the discovery of abundant evidence that the art of bread making was practiced by our ancesters as early as the Stone period.

In written history, bread is first mentioned in Genesis 18–5–. Abraham, wishing to entertain the three angels on the plains of Mamre, offered to "fetch a morsel of bread." Again we find it referred to Genesis 19–3, where we are told that in the city of Sodom, Lot entertained two angels. "He made them a feast, and did bake unleavened bread, and they did eat." Again in the story of Joseph in Egypt, when "Pha-

raoh hanged the chief baker, as Joseph had interpreted to them." Genesis 40–22. And it seems to me that the baker has been held up to execration almost ever since; perhaps in many cases justly so. In the middle ages, the baking of bread was considered as largely affecting the interests of the public, and was put under strict regulation and supervision, and these special restrictions continued to affect the trade down to very recent times.

In England, an Act of Parliament was passed in 1266, regulating the price of bread, and that continued in operation until, 1822, in the city of London, and until, 1836, in the rest of the country.

"Adulteration: the act of debasing a pure or genuine commodity, for pecuniary profit." That bread was adulterated, there seems to be no doubt, for as far back as the reign of John, in 1203, there was a proclamation throughout England for enforcing the legal obligations of assizes as regards bread. There were strict laws made by Parliament for the punishment of unscrupulous bakers. If detected, they were placed in the pillory, or fined and imprisoned, and if all these failed to correct the evil, they, at last, were deprived of their business by the destruction of their ovens and were compelled, to forswear the trade forever.

There were probably two reasons why the baker was tempted to adulterate his bread: first, because the flour of those days was probably much inferior to the flour of to-day, for be it remembered that the process of milling has been greatly improved; then in Enlgand the flour was dark, and made from wheat grown in a damp climate, and could not be made to produce the light, white, sweet bread with which we are so familiar; then the baker was not so skilled as now. The second temptation to the adulteration of bread consisted of the fact that the price and weight of bread were regulated by law. Frequently, the profits were meagre, and illegal efforts were no doubt made to produce the legal bread, white and light, to satisfy the law and the exacting taste of customers.

Ure's dictionary, probably one of the best of the old English authorities, in speaking of the practices indulged in to avoid the laws, says, "The substances now almost exclusively used for adulterating bread are water, alone, or incorporated with rice, or water and alum. Other substances are, or have been used for the same purpose. The retention of water in bread is secured by underbaking, by the introduction of rice, of potatoes, or of alum.

"Underbaking is an operation which consists of keeping in the loaf water which would otherwise escape in baking. It is therefore a process, for selling water at the price of bread. The addition of boiled rice to the dough is frequently used to increase the yield of loaves. This substance absorbes so much water that as many as 116 quartern (four-pound), loaves can be made from one sack of flour.

"Alum, however, is the principal adulteration used by bakers. Its introduction into bread not only enables the baker to give to bread made from a poor grade of flour the whiteness of the best bread, but to force and keep in it a larger quantity of water than could otherwise be done. The defense set up in behalf of alum is that without it certain qualities of flour cannot be used, while with its aid, all the flour which would otherwise be of no value, it made available for human food to the great benefit of the poor, who would be the first to suffer from an increase in the price of flour, which must result from its rejection."

Liebig, the great German chemist, in his "New Letter on Chemistry," also devotes considerable space to the adulteration of bread. Among other things he says: "Proposals which have hitherto been made to use substitute for flour and thus diminish the price of bread in times of scarcity, prove how much the rational principles of hygiene are disregarded still, and how unkown are the laws of nutrition. It is with food as with fuel. If we compare the various kinds of coal, of wood, an of turf, we shall see that the number of pence paid for a certain volume of weight of these materials, is about proportionate to the degree of heat which they involve in burning. The mean price of food in a large country is ordinarily the criterion of its nutritive value.

"The addition of wheat flour, of potatoes, starch of dextrine, or of the pulp of turnips, gives a mixture the nutritive value of which is equal to that of potatoes or turnips, or perhaps less. It is evident that one cannot consider as an improvement transformation of wheat flour into food having only the same value as rice or potatoes.

Hassell, in his "Food and its Adulteration," speaks more particularly of alumed bread. "The use of alum in bread", he says, "is particularly injurious. It is true, it causes the bread to be whiter than it would be otherwise; whiter than was intended by nature; but it imparts several other properties to the loaf. It hardens the nutritive constituent of the bread and so makes it more indigestible. It enables the baker to adulterate his bread with a larger quantity of rice or potatoes than he could otherwise employ, and lastly, he is by the use of alum permitted to pass off an inferior grade of flour for that of superior quality".

But all this is changed now. The authorities I have quoted speak of the practices of early English bakers, not of those of the present enlightened day and generation. The only connection between them and the present is the impression which still remains in the public mind and which couples the bread making of to-day with that of ancent times when flour was poor and facilities very meagre.

After careful examination, I fail to find recorded a single specific instance of adulteration in bread for 500 years. The charges are all general, and do not prove anything. They are made by scientists upon theory, and hear-say evidence but not upon facts. The bread of to day

is not adulterated, and the baking of it is regulated entirely by competition.

As early as 1702 the laws of England were modified as relating to the baker, and few, if any samples of bread were found to be adulterated, but the price of bread was still more or less subject to law. Now, however, I do not know of a single instance in this country, of any statutes that regulate the size, quality, or price of bread, and I say, so far as this country is concerned, without fear of successful contradiction, that no baker who can read and write, and who is in his right mind, adulterates his bread. He could not do it and escape detection. The use of alum would be eespecially suicidal to his interests, as even a small portion of it would be sufficient to give the bread a disagreeable taste.

Both potatoes and corn meal are used a limited extent in some varieties of bread. So, also are baking powders, bi-carbonate of soda, and sour milk. But these are not adulterations. They are used to a greater or less extent in all private famiilies as well as by bakers. But even if a baker wants to be dishonest there would be nothing to encourage him. The incentive to adulterate bread is entirely gone, because the miller by his skill makes many grades of flour, some so pure and white that nothing could be whiter, and all so cheap that nothing could be cheaper. If the baker wishes white loaves, he has only to select white flour, and by skill in working the dough, he defies the good house wife to equal him.

The question has often been asked, "How do you make your bread so white?" and then the question has been truthfully answered, an incredulous expression comes over the face of the questioner, because he has in mind the traditions of 500 years and the unskillful work of the maid in the kitchen and probably his dyspepsia preys upon his senses to such an extent that he is ready to believe the baker of to-day is no better than the baker we read about. But with a practical experience in baking business for more than a quarter of a century, I boldy say that such a thing as adulterated bread does not exist in the great baking industry of this country. The bakers' bread of to-day is as pure, as sweet, as wholesome, as were those famous loaves made by your grandmother, in your boyhood days, to get a slice of which, well buttered and spread thickly with molasses, was a treat for which you would gladly have walked four miles, or worked half a day at a wood pile

Now, gentlemen, I have some specimens of bread here, that I would like any that are interested to come and examine. I will first show you a specimen of bread made with flour and potatoes. It is sold on the market as potato bread and is so known to purchassers. The amount of potatoes to flour is about 15 per cent. or 15 pounds in a hundred. The potatoes are boiled and mashed to what is known at home as "mashed potatoes." After being thoroughly prepared they are mixed into the dough while it is in course of preparation.

The sponge is first set with the flour, and after the flour is thoroughly incorporated with the yeast and the carbonic acid goes through the whole mass we then put it in what we term the mixer, a machine that will hold about six barrels of flour with the necessary amount of water, and we add to the potatoes mashed and as much more water as is necessary and some more flour. That in turn is allowed to get as light as it will; then it is formed into loaves and baked. If any of you are interested we will be glad to have you come and test a sample of it.

This bread is made with corn meal. We have white corn which is ground as fine as flour, if you were to see it you would say it was the whitest powder you ever saw. The corn is thoroughly kiln dried and then it is ground until it is as fine as flour and extremely white. It is then boiled and made into mush, and about the same proportion of corn is incorporated into the flour that we make bread of as there is potatoes in the potato bread, and we sell it from our place as corn meal bread. It is largely used by the mill hands because they say it "sticks to the ribs." It is sold for precisely what it is, and it does not dry so quickly as some other breads. It is a little harder to bake.

Dr. GROFF. What is the reason your baker's bread drys so quickly?

MR. MARVIN. It is usually a little lighter and a little more porous. In going through Switzerland you may see a man and his horse making their dinner off the same piece of bread: the man will break off a piece for himself and then give the horse a piece, and that is what we are coming to in this country.

Here is a bread that is made with a mixture of sugar and shortening in the bread. By shortening I mean with lard, and then it is manipulated through the machine and the manipulation makes it white. You will find it has a very white texture and it is very short. The glutinous parts of the flour have been made tender by the addition of the sugar and the shortening.

Here is a specimen of bread that is made entirely of flour, water and yeast. There is no shortening or anything else put in it.

Here is a specimen that is made with milk in addition to the water, very common among our German friends, rye bread.

The CHAIRMAN. The discussion of Doctor Edward's paper is now in order.

Dr. PEMBERTON DUDLEY. Mr. Chairman: I have been very much interested in this bread question, but I want to indorse one statement Dr. Edwards made in his paper in reference to the attitude of our railway companies in the ventilation of their cars.

A year ago at our convention at Wilkes-Barre, Dr. Dudley of Altoona, the chemist of the Pennsylvania Railroad Company was present, and he was speaking, in a private conversation, in reference to the efforts they were making to improve the ventilation of their standard cars. He said "We propose to give two years to study, research and experi-

ment. The officers of the company have declared that they will make any change that may be found useful and practicable. They do not propose to stop at anything, but to get the best–the best that is now to be had or the best that can be devised in the way of ventilation."

I mention that because I am simply confirmed in what I heard that man say by the official statement the doctor has laid before us in his paper. I think it sounds well for our railroad companies.

Dr. C. M. ALEXANDER. Mr. Chairman, while I am glad to hear that the railroad companies are so anxious to do everything possible in the way of sanitary measures, yet I think, as as Sanitarians it would be well for us to look on the other side and see what they are not doing. For instance, in the matter Dr. Edwards brought up of railroad employés only working a certain number of hours a day, and then as I understood him, having time to rest, I do know that in the town of Columbia, which is one of the points on the Pennsylvania Railroad where their trains are changed, that I have had patients frequently called out two hours after coming in, and that will continue perhaps for a week; and a railroad employe is very frequently unpermitted to get a nights rest for as much as a week at a time.

They report when they come into the Dispatcher's office, and each engineer, fireman, and brakeman has to register his name and I suppose—I am not certain of it—The dispatcher runs on down the line until these men come again; but nevertheless they seem to come very frequently. And they have caller-boys whom they send around to the houses to call the men out and tell them that their train is ready and that they must report for duty; and they are frequently forced to report as soon as two or three hours after they come in: and this is a common occurrence.

It is the cause of disease. I have had patients who were entirely used up in this manner, and they have been under my hands for weeks. I think that while the railroad company proposes to do right they are not doing right in this matter, and it is there where the Sanitarians want to look.

Now as regards the cleansing of these cattle cars, and of that other matter to which Dr. Edwards also referred. There is a siding in the county of Lancaster running from the town of Marietta to Shock's Mills, two or three miles, which is used for the storage of empty cars. They allow their cattle cars brought from Philadelphia, to stand on this siding. These cars are often six or eight inches deep with manure and those cars are allowed to stand on this siding and the odor is simply terrible.

Some of the people along the railroad really make a business of placing one party down toward Marietta and another up towards Shock's Mills, who watch for trains and when a train comes along with its deposits on they come in there with wagons and load them with this ma-

nure and haul it away and sell it to the farmers around about. There is a great deal of money made in that way. Nevertheless, the cars stand there, and in hot summer weather it is very disagreeable to persons living along this railroad. Yet there is a still greater nuisance. This manure comes from slaughter yards, livery stables, etc., but I wish to speak especially of this manure that comes fromthe slaughter houses. It is brought into the borough limits of some of these towns and thrown off in piles as much as one hundred or two hundred tons, with portions of decaying animals, entrails, and all that matter, and the people living around about are frequently—often as much as a month or two at a time, especially late in the spring of the year,—forced to close all their windows even so far as half a mile distant.

I know that in my own case it has been one of the important points in my removing an establishment that I was running to another different site, to get away from these on account of those fearful piles of manure that are allowed to lay there and decay for a long time.

These are things that I think as sanitarians we ought to bring up to the railroad company, and ask them to remedy. They could do it. If they would make it obligatory on whoever is receiving these cars in there to remove the manure at once, within a certain length of time, it would require no expense to be paid by the railroad company. I think the railroad company could be induced to do it.

These are things that are certainly very injurious to health.

Dr. Chorr. I wish to say a word in reference to the hours which the employés of these railroad companies work, brought up by the statement of Dr. Edwards, as to the two principle companies operating in this state, that the men never work over twelve hours.

As coroner for my county I held an inquest last winter on a man who was killed in a collision, and all of these men surviving of the one train swore that they had been on duty for fifty-two consecutive hours. The man who was killed we proved by sworn testimony had been on duty for fifty two consecutive hours, and had been called out after having gone off only two hours preceding. I did not attempt to follow up how many hours he had been on duty before he was called out, but he had been on duty fifty two hours after he had been called out

Just a few days ago there was another accident on the same road and I again met a special agent and detective of this railroad company, and in speaking about the former accident he said that he believed beyond a doubt every man on one of those trains which collided during the winter was asleep; I had not been impressed with the fact that the engineer was asleep, however after the inquest I came to that conclusion. This detective said he had not a doubt that every man on the train was asleep at the time of the accident. We asked the men whether they were compelled to be on duty or not, they said not "compelled" but "expected." And further inquiry brought out this fact they were paid

so much per trip, and if a man was called out he went to work when he was not able to go simply because he was paid for working. That was occurring last winter on one of the principle lines of this State.

There is no doubt that this is the cause of many of the accidents which are occurring day after day. Right in front of my own house there were two collisions that cost the company ten thousand dollars apiece. One four miles from my place said to have cost them $25,000; and such accidents were occurring day after day. The only explanation that the people in our section had was that the men were worked in this way.

Fifty-two hours duty consecutively is a very long period of time. The men are not compelled to work, but they are called out as the doctor has said.

Dr. THOMAS HUBBARD. Mr. Chairman: The question of ventilation has been a study of sanitary engineers, but from a hygienic point of view it has fallen largely upon the medical profession for the last fifty years doubtless. At least the medical profession have been insisting on the importance of ventilation.

In regard to the ventilation of cars it should certainly seem as though the means were at our own disposal of securing constant, in an artificial manner, reliable currents of air. That has been the desideratum for which mechanical engineers have been laboring in the matter of ventilating buildings, and largely unsuccessful—that is without employing chemical agencies.

In the railroad train that current of air is established getting at it in a roundabout way. The motion of the train is, say 30 miles an hour; deducting from that the average velocity of the wind which might be moving with the train you have at a low estimate—the train is moving through a volume of air equivalent to a current here of from 15 to 20 miles an hour. There you have the main point for an actual ventilation.

If we were always sure of a wind blowing about our homes of from 15 to 20 miles an hour there would be no question about being able to secure ample ventilation. Of most importance in the matter of home hygiene, or rather in the healthful bringing up of children, is the surrounding them in their school life with good hygienic surroundings.

An investigation carried on in Ohio by a competent physician examining into the ventilation of school houses, has proven that there is a great dificiency in the matter, and the state in making education in Ohio somewhat compulsory, assumes an obligation to the children that they compel to go to school. There is an obligation to meet.

The State of Indiana is at present recognizing that obligation. The State Board of Health has determined to inspect and supervise the condition of the school houses all over the State, and where ventilation or other surroundings are unhealthful, they will insist on remedies.

The system of ventilation described by Dr. Edwards, or rather the

system of dry closets, is in systematic co-operation with a system of ventilation which is a perfect success. I will spare you a rehearsal of the details of it but I do not think that fault can be found with the scientific principles. Besides being perfect in principle, it has proven to be efficient in operation.

In locating the in-take in all the buildings I have examined, the avoidance of unwholesome surroundings of the school house has been laid stress on. I would say that the air passing into and out of these free air in-takes, as the result of many examinations, is warmed to an average of between 80 and 100 degrees; and it is often conducted by free air pipes into the room above to be warmed.

These air conduits are always perpendicular; each room has a separate air conduit. To secure continuous ventilation the cold air is located in direct communication with the room being so regulated from the room that a definite quantity of warm or cold air can be let into the room. In other words the air can enter the room at any desired temperature According to the old systems of ventilation the air was let out of the top of the room.

Without stopping to discuss the question of the relative purity of the air at the top of the room and at the bottom, I will say I do not think that is of as much importance as the heat of the room. It is impossible to warm a room unless you draw air off at the base board and from there the ventilation is passed off under the board. It is then cast into a foul air chamber.

The average amount of air entering a room, (each room containing about 40 puplis) as result of from 20 to 30 examinations, is sufficient to give each pupil from 15 to 18 hundred cubic feet of air each hour. In other words the air of the room is changed from 6 to 8 times an hour or every ten minutes. That means a velocity of air in the foul air gathering room—standing at which you can see the deposit in the dry closets—flowing at the rate of from 400 to 600 lineal feet per minute. 400 to 600 feet is equivalent to a current of air of five or six miles an hour, a person standing long in it readily appreciates that fact; you can endure it but a very short time without the sensation of taking cold.

Going back: Of, course, the propelling power is the relatively heavier power of the column of cold air compared with the column of air in the building—I say in the building for that may be regarded as one continuous column from the furnace to the out-let shaft. It is in the first place, started from the furnace room thence expanded and then again contracted into where the air enters the foul air gathering room, and thence out the high shaft. From many examinations I can say that the foul air leaves the top of the shaft at the rate of about five miles an hour in its upward ascent.

Now regarding the dry closets and the capacity of this volume of air for dessicating the deposit that is there. The air leaving the room,

from experiment, I have never found higher than 81 per cent. tumidity in the foul air gathering room. That means each cubic foot of that air is capable of taking up 1:32 grains of moisture. Now the exposure of the excreta is not complete so every cubic foot is capable of taking up only one grain of moisture. The average amount of water excreta from each pupil is—I have forgotton the exact number of grains, but from many estimates that I have made I can say that the theoretical capacity of air for taking up moisture in the excreta from a given number of pupils is at least two and one half times the maximum amount of moisture that you could estmate could be deposited in that closet from the same number of pupils. Here we have an exposition of the correctness of the principle in practice against which words amount to nothing. The only way to convince and to educate the people in this regard is by personal inspection.

Mr. MURPHY. Mr. Chairman, I had the pleasure of examining this system of ventilation and disposal of wastes yesterday, and I must say that I was extremely gratified with it, I have always been decidedly of the opinion that a great deal could be done in the way of removing dangerous and disagreeable bodies from organic matter by temperature, but I never before saw so perfect an illustration of it as I did yesterday afternoon.

That these deposits should have been reduced to the condition in which they were yesterday evening before dark when we were there, so that they could be taken in the hand and put to the nose without the slightest unpleasant odor, simply like a dry chip, when some 500 or 600 children had been in that school, so I was informed, and made all the ordinary use of closets, is certainly a remarkable illustration of the effect of aeration in dealing with organic matter.

As far as the drafts were concerned they were just as rapid—I don't know that the drafts all passed so thoroughly through the room as Dr. Edwards' chart indicates we did not experiment as to that; but in all other particulars—

Dr. EDWARDS. I am not so strongly advocating the ventilation as I am the disposal of the excreta. The ventilation I believe to be good, but I can't swear by that as I can by the other.

Mr. MURPHY. In a room it is probable that air in common with any other fluid, no difference how high its velocity, at certain points would form eddies where there would be dead air as there is dead water in a stream in some places, and it really is a very great thing to get absolute and complete circulation of air in every part of the room.

We also saw it burn. A very small quantity of coal oil was deposited on one of the piles under the closet and lighted with a match. We remained there for some time and it was not an unpleasant place to stay and we found that this combustion continued at a rate which was almost as great as when we first started it—that is after the first flash

of fire was over. And when we came away the indications were that the coal oil had been pretty thoroughly burned out by that time and that the combustion was entirely of the remaining excreta.

Professor LEFFMANN. I do not know that I can add anything to what has been said on this subject. I admired very much the successful application of the method, the cleanliness and the success of the operation and particularly was pleased with the fact that the complex and troublesome system of water carriage—the complex machinery which was so liable to get out of order, particularly in a public institution, and which is never neat and clean even at best—was done away with. I think that is one of the advantages of the system. It diminishes the pollution of the water by excreta, and also gets rid of this machinery which is so liable to become inoperative, and then the arrangement becomes worse than nothing at all.

Mr. MURPHY. I regret very much Mr. President, we have not a specimen of the residuum here. It is quite as clean and decen as a piece of chewing tobacco.

Mr. HADDOCK. I should merely like to add that the real facts are that in the high school building, as suggested, the system was not carried high enough, but since it has been changed it has been in perfect operation but through prejudice the original action of the board was enforced, but the use was stopped merely for a short time.

Mr. MURPHY. It goes without saying that the whole thing depends on the successful operation of these drafts, and a draft is one of the most difficult things in the world to manage.

We all know that under certain circumstances an engine of a given horse power and with certain kind of boilers, with a stack of a certain height and your flue built a certain way you get perfect results; and you may do the same thing and have no end of trouble with it. There is nothing more difficult to determine accurately than the behavior of drafts; consequently a great deal of skillful engineering may no doubt be required in a case of this kind, in a large building.

There is one particular case of a draft out west where two shafts were built, one large, and one small one. The air keeps going up one and down the other, and to this day no one has been able to explain the reason why, it does so.

Dr. EDWARDS. Do you think the drafts were not right in this thing?

Mr. MURPHY. I thought everything was working there absolutely to perfection yesterday. I did not see anything to indicate that it was not.

As far as everything down under the closets was concerned and all around there, I couldn't see a thing that I would not be entirely satisfied to accept if the responsibility rested with me.

Dr. EDWARDS. I only want simply to answer Dr. Groff. Dr. Groff raised the objection that I felt perfectly satisfied would be raised. Now

I said on page two of my paper, "Railroads seem now to thoroughly understand that a man who is overworked cannot do good work. I have been not only gratified but surprised as well, and am sure those that hear me are also to learn that no railroad employe is obliged to work more than twelve hours out of twenty-four".

Now that is a statement I knew nobody would believe. I wouldn't believe it myself unless I was officially informed of it. I will simply read the official answer to the question I sent to the Lehigh Valley and Reading Railroad. This is the official letter from Sweigard of the Reading road to my question as to the number of hours of work required by a employe, the answer is, "Averages seven to twelve hours according to character of occupation; nobody more than twelve, nobody less than seven." Then from Latta of the Pennsylvania Railroad, the answer is "from six to twelve hours, dependent upon the character of the employes". That is all the information I have.

I feel as you do Dr. Groff, but there is the official information signed by Sweigard of the Reading Railroad, and Latta of the Pennsylvania Railroad if it is wrong they are responsible for it.

Mr. MURPHY. The facts are against it, Dr. Edwards, I say I think the facts are against it. As I say if I didn't have this communication I would not have taken it and I only about half believe it.

Dr. ALEXANDER. But the statements in these letters are true; they are not "obliged" to do so.

Dr. EDWARDS. I didn't mean that: I did not ask them to give me the legal interpretation of anything; I asked them to tell me what they really did.

I went into that in a practical way and they gave me that officially; they are willing to have that go on record as my report to the State Board of Health.

Mr. MURPHY. I was once so unfortunate as to occupy a politicial position. The strict and absolute rules were that we were not required to pay political assessments; but we paid them, and we paid them because we thought we had to.

Dr. EDWARDS. I know but you didn't put that in writing. This is down in writing, it is official and goes on the record.

Mr. MURPHY. If you write to any political manager in Pennsylvania to-day and ask him whether any govermnent employes are required to pay political assessments he will put in writing that they are not, but he will say that they had better pay it or get out.

Dr. LEE. Mr. Chairman, as the hour is late I move that the remaining papers on the program for this morning be postponed until the session this afternoon.

This motion was duly seconded and carried.

On motion Adjourned.

FIFTH SESSION.

The Convention was called to order by the Chairman, (Mr. Moore.)

The CHAIRMAN. We will take up the next paper, which is, The Hygiene of the Teeth," with an illustration, by J. O. Flowers, of Pittsburgh.

HYGIENE OF THE TEETH.

By J. O. FLOWER, M. D., *Pittsburgh, Pa.*

There has been so much said in regard to this subject, that I will only speak of the actual facts, and practical knowledge obtained in the last twenty-five years, and will present to you to-day a subject born and raised in the heart of our city, eating and drinking as ordinary people do in this civilzed community, but not subject to the unnatural position required by the central board of educathion who are conducting our public school system of the present day.

This subject of illustration—his ancestors for two generations back had very poor teeth, so that the experimentor in this case had much to contend against.

The teeth in particular show the debilitated condition of the spinal cord, to furnish the extremities with healthy nerve force to maintain the vigor of life, and power to perform their duties when called upon by the muscles of the face and jaws. They are either too tender by decay of the bone structure, thus leaving the pulp or nerve exposed to heat or cold, water, air, or food, or whatever may come in contact with them, causing nights and days of torture to the human being, almost from childhood up to the ago of maturity, when they should be in the prime of life (we have to grasp like a drowning man at a straw), to sustain life, *and looks as well* by buying so much *crockery* in the shape of a set of false teeth, to go *mumbling* around for the balance of life, half masticating his food in prepartion for digestion, and thus preparing that over-worked organ (the stomach) for premature wreck.

Promotion of healthy denture will never be acquired until we as a class of people, adopt such rules. Substantial food from the time a child is able to hold it in its own hands. Food at the proper time. Plenty of fresh air daily, and at nights as well. With the care of a good healthy nurse, or its mother.

No confinement in school, or with studies before the age of 8 to 10 years, after that 4 months schooling, and 8 months good muscular work in the open air, or recretion with exercise. This mode of life had demonstrated itself long ago by the ancient Romans, and the staple men in the large cities of the present day.

Seventeen public school children out of every twenty have bad teeth,

and the reader thinks it is caused by the unnatural sitting position they are placed in five or six hours daily, producing curvature of the spinal column, or vertebra, causing pressure on the spinal cord, curtailing its proper flow of nerve force to the extremities of the nerves. Thus depriving the teeth from a vigorous supply of life, from the fifth pair of nerves naurally ordained for them, I could not begin to enumerate the number of cases where the whole inferior and superior arches of teeth have been destroyed by very slight injuries to the spine.

Ward Nichelson became a confirmed sufferer from the rapid destruction of denture, caused by an upset out of a buggy. He died years after at the Homœopathic hospital sitting in his chair, while his room was being prepared for him.

Mrs. S, had a beautiful set of teeth, was dismounted from her horse, back injured, in less than two years nearly every tooth in her jaws was destroyed by decay.

The writer could cite many like cases.

Think of the number of transient calls made on the dental fraternity by *children* to be cured in a few minutes, owing to the scarcity of time, urged by over ambitious parents and *crammed* by the teachers for some examination when passed, would receive a medal, and that medal had in many cases a companion name and age on a long box, from which no parents pride ever returned.

Now, we know for instance, the effect of microbes and micro-organisms upon living tissue. We know that living tissue will resist any moderate amount of action, else we would have no immediate healing in any case, and we know very well, and have known for years, that immediate union has been obtained in the absence of aseptic and antiseptic measures, it is because living tissues resist and are able to overcome certain extraneous causes.

Now, I believe the same is true in regard to the teeth in a measure, and that the acids, and so on, in the mouth would not have much effect upon good sound teeth, where the vitality of the teeth was good; because there are many people, people with magnificent teeth, who never took any care of them whatever.

I believe Dr. Flower is right in his practical deductions, that is when the organism of the nervous system, which is principally phosphoretic, uses up tissue that ought to go to the teeth, the heavy draft on the nerve centers for that sort of element makes a deficiency there, which is diverted from the proper uses of nutrition and is used up in the extreme attack upon the nervous system. It strikes me that would hold good.

I am not quite equal to expressing what I intended to say about it, but that in the main is my view of the matter,—that it is not altogether a local matter.

Dr. PEMBERTON DUDLEY. I have long been disposed to the belief that very many of the disorders of childhood during dentition, are due to the

fact, that the nerve centers are being deprived of their sufficient modicum of some one of the elements of nutrition, by the robbery to which they are subjected by the rapid groth of the bony tissues, including the teeth.

One of the reasons why I think so, is because of the marked connection that there appears to be between the dentition process and the nervous system—between the disorders of the dentition process, and the disorders of the nervous system during that period. This is, I think, something more than a mere speculation; I think it has a good many pathological facts to support it, or to confirm it.

Whether that element of nutrition that is thus lacking, is some combination of phosphoretics or not, I do not know; it seems not improbable. We know how largely phosphorous enters into the nutrition of the central nervous system, and we know how largely it enters into the nutrition of the bony system, and I have often felt that in all likelihood this large amount that is absorbed ravenously by the bony tissues during this period, simply leaves the nervous system with an insufficient supply, and perhaps gives rise to many of the conditions that we find prevalent at that period.

Dr. FLOWER. The stand that I have taken to-day is to a certain extent an original position. I was very glad to hear the remarks of my worthy friend from Philadelphia, (Professor Leffman), for I know there are a great many very learned gentlemen in my own profession in that city. But I must take exception from their school on facts and practical demonstrations. Not on a theory read from a paper that they never knew the base of, but facts that connot be denied.

How often do we have patients visit our office with the exterior portion of the tooth in a perfect state of preservation, they never knew that there was the least decay, yet, on examining the tooth, placing it to the light, (for you know all teeth are translucent—you cannot call them transparent altogether, but by throwing a reflected light back of the tooth you will find it is translucent) you will recognize that there is a difference in the color in a particular portion of the tooth? Thus in those cases I have notified the persons that the tooth is one half destroyed—the bony structure, not the enamel, and it is only a question of time until it strikes through.

Now if I would take the point my friend from Philadelphia takes, that the acids of the mouth and stomach decay the teeth, then it would commence on the outside, or it would always commence between the teeth, which is not the case. One half of the decayed tooth appears dead, shows on the enamel of the tooth from the interior of the arch and not between the teeth, although it often occurs there. But in nearly one half of the cases presenting themselves, the bony structure of the tooth gives way before the enamel, and decomposition takes place and it is on that ground that I base that article, and it is on that ground I

raised a family with healthy denture—a practical fact that cannot be denied.

Dr. LEE. I would like to move that the order of business be interrupted for a moment. The object of the State Board of Health in having a convention held in Pittsburgh, was that we might avail ourselves of the experience of sanitarians in a large city situate upon water courses, between high hills, as this city is situated, and find out what their difficulties have been, and what they have found to be the most successful means of surmounting those difficulties.

So far during our discussions these local topics have been almost entirely ignored. There has been but one paper, I think, which has made reference to that in any way.

We are fortunate now in having with us in this convention, a gentleman who knows more of the sanitary history of Pittsburgh than any other man in it. He has risen from a sick bed in order to be present with us, and it may be a tax upon his strength to remain too long at our session. I would therefore offer a resolution that the convention shall now hear Mr. Crosby Gray, the former health officer of Pittsburgh, upon the subject of the sanitary history of this city.

This motion being seconded by Dr. McClelland, was put by the chairman and unanimously carried.

Dr. CROSBY GRAY. Mr. Chairman: before presenting this paper I deem a word of explantion and apology necessary. Two or three months ago Dr. McClelland, the local member of the State Board of Health, requested me to prepare a paper for presentation at this meeting. I hesitated at the time and so informed him.

A few weeks ago I received another invitation from Dr. Lee, the Secretary of the Board, again requesting me to do so. On account of my time being so fully occupied I did not think it possible to prepare such a paper, at least such a one as I would like to prepare and read to an audience of this character. But learning that the subject of local sanitation would probably not be treated at all, I, at the last moment concluded to use a few of my spare moments in preparation of what I could.

Unfortunately I was caught on Tuesday with a very severe cold and have been confined to my bed ever since. This apology and this explantion must account for the incomplete condition of this paper.

A BRIEF HISTORY OF PUBLIC SANITATION IN THE CITY OF PITTSBURGH.

By CROSBY GRAY, *Chief Clerk Department of Public Safety and Ex-Health Officer of Pittsburgh.*

The Borough of Pittsburgh was erected into a city by virtue of an Act of Assembly passed March 18th, 1816.

Prior to the year 1851, public sanitation was of somewhat mythical and legendary character. The public records are almost entirely silent

upon the subject, except that they mention the fact of an annual appropriation of one thousand dollars having been made during a series of years before that date, for "sanitary purposes."

How, or by whom these several amounts were expended, are question which investigation has failed to answer.

Probably on account of the threatened advent of Asiatic cholera into the country, the necessity for the establishment and equipment of a sanitary organization or body for the better protection of the public health, was realized by the city authorities. The legislature was accordingly appealed to, and enacted a law creating a corporation to be known by the name, style and title of "The Board of Health of the City of Pittsburgh."

The title of said act may be regarded as quite unique, and is a relic of the good old days of special and omnibus legislation. At this time, when the question of Prohibition *vs.* License is being so earnestly and ably discussed, a special reference to it may not prove uninteresting.

It reads as follows:—

"An act to establish a board of health, and to secure the city and port of Pittsburgh from the introduction of pestilential and contagious diseases; and relative to the granting of tavern licenses in Butler County."

What analogy there may have been between the establishment of a sanitary plant in the city of Pittsburgh, and the gratification of the bibulous propensities of the average Butler county citizen, through the medium of a legislative indulgence, is a subject which I leave to the future historian and searcher after truth.

This act provided for the incorporation of a board of health to consist of nine citizens, to be elected by the city councils and prescribed its duties, invested it with power to establish quarantine, and adopt rules for the government thereof; and, provided in a general way, for the removal or abatement of nuisances.

It also provided for the registration of deaths. This provision required the physician or surgeon in attendance upon any person who may have died in the City, to leave a note in writing with some member of the family of the deceased, specifying the name, age, color, residence, whether married or single, employment, disease of which said person died. In case no physician or surgeon had been in attendance, or in case said physician or surgeon refused or neglected to perform said duty, then the family of the deceased should apply to a physician appointed by the board of health to make the necessary examination, and furnish the note referred to. The sexton of any church, or the person or persons in charge of any cemetery, vault or burial ground within five miles of the court house of Allegheny county were prohibited under pain and penalties from permitting the interment of the body of any such person, until he had received said note in writing. The sexton was required to enter said note upon a blank schedule to be

furnished by the board of health, and delivered with said schedule on Monday of each week to the health officer for publication in such forms as might be directed by the board.

The inefficiency of such provisions for a correct registration of deaths, must be apparent to the most casual observer.

The rapidly approaching danger from cholera, developed the necessit for a more extended and comprehensive scope of power and authority on the part of the board of health.

In order to effect this, the legislature was again invoked for aid. On April 8th, 1852, a supplement to the original act was approved and became a law. It imposed a number of additional duties upon the board of health, such as the collection and removal of nuisances found upon the public highways, wharfs, docks, &c., requiring privy-wells to be emptied or corrected, giving authority for securing, by purchase or otherwise, a place or places where said material should be deposited; providing for a systematic plan for removing the contents of cesspools, and other offensive substances; prescribing the kind of vehicles to be used for making said removals, fixing the fees for licenses, and permits to engage in said business; prescribing the mode of legal procedure, and fixing the penalties for violation of said provisions and also authorizing the appointment of a health officer, who should be the executive officer of the board.

Contrary to general expectation, cholera only prevailed to a limited extent during the years 1851-52. In the absence of any record of the number of cases, and depending upon the record of deaths (which was necessarily incomplete) the prevalence of the disease must have been very limited, or the rate of mortality very low, as in 1851 but a single death is charged to that cause, and in the following year, only four.

The year 1854 was signalized by the advent of the disease in what must have been a virulent form, as we find it assigned as the cause of five hundred and thirty-five deaths.

The records of the board of health fail to show in a very satisfactory manner, the action taken to arrest the progress of the disease.

Enough, however, is gleaned from them, together with the recollections of some of the oldest inhabitants to warrant the belief, that the preventative measures used consisted principally in the cleaning and probable disinfection of quite a number of privy vaults, the sprinkling of lime in the street gutters, and the lighting of numerous bonfires in the infected districts, as if perchance the anger of the pestilential god might in some manner be appeased by a burnt offering.

In the foregoing remarks, we do not desire to be understood as reflecting in any manner upon the good sense, or efficiency of the sanitary authorities of that day. Their knowledge of how best to combat such a disease was necessarily circumscribed, and a paltry thousand dollars per annum, which was the amount of the appropriation made during a

series of years, both before and after the date referred to, would not justify a great deal of scientific research, or a very lavish expenditure. They did the best they could under the circumstances, and deserve due credit.

Almost from the date of the organization of the board of health, it had been somewhat intimately associated with the board of guardians of the poor. They occupied the same suite of rooms, the secretary of one was appointed health officer of the other, and several members of the poor board were also members of the health board. Finding that very often the usefulness of the latter was being subordinated to that of the former, thus working injury to both, it was thought best that a decree in divorce should be issued. For that purpose the legislature, at its session of 1869 and 1870 passed an act declaring the holding of membership in both boards at the same time to be incompatible. This resulted in the immediate resignation of several members of the board of guardians of the poor, as members of the board of health. This action marked the beginning of a new era in the history of the health board, and one much to its advantage. It at once sought other quarters.

On the first day of February, 1869, much to his surprise, the writer was honored by being elected health officer. Without any experience whatever in the conduct of affairs pertaining to public sanitation, he with considerable mental hesitation, accepted the position, and at once assumed the duties.

The stock in trade on hand consisted of one city code; two death registers, containing the mortality list up to that time; one minute book, containing a record of the proceedings of the board from the date of its organization: one cesspool permit book; three hundred blank certificates of death, printed in sanguinary colored ink; two hundred blank schedules for use of sextons in making returns; three hundred blank notices for abatement of nuisances; one hundred blank lists of diseases, arranged alphabetically; one antiquated desk, and a half dozen chairs.

The working force consisted of the health officer and one assistant. The population of the city was estimated to be 85,000.

Relying upon the oft tendered support and assistance of some three or four members of the board, the health officer commenced a task which, after an experience of twenty years, appears to have been of herculean proportions. A number of reforms were found necessary to bring the service up to a standard of excellence in keeping with a rapidly growing city, and to in some measure keep pace with that of some of her sisters.

In the inauguration of these reforms, the wise counsel and energetic support of the members and officers of the board were of incalulable value. Among those deserving of special mention in this connection

were the late Hon. A. H. Gross, M. D., then and for a number of years president of the board; the late Hon. Matthew Edwards; the late Marshall Swartzwelder, Esq., then Solicitor of the board; and that efficient and thorough sanitarian Dr. W. Snively, who for sixteen years so ably filled the position of Physician and registrar of vital statistics.

The first reform determined upon was in improvement in the mode of removal of, and disposition of the contents of cesspools. From time immemorial, this material has been removed in open wooden box carts and deposited along the banks of the rivers, or on the various dumps which abound. After a strenuous effort upon the part of the board and its officers, resulting in considerable litigation and being productive of much unjust criticism, a partial success was achieved. The old and disgraceful wooden carts were abandoned and supplanted by cylindrical iron tanks, mounted on four wheels and by means of proper appliances, made almost, if not quite, air tight. The old method of disposal was, also, after a hard fight abandoned. Dump boats were moored in the rivers from which the material was deposited in the streams. This has been, within the past dozen years, partially improved upon by the substitution of a boat *into* which the contents of cesspools, and other offensive material is deposited, when it is towed down the Ohio river to a point below the city limits, and dumped.

It is hoped that the pollution of the rivers and waste of valuable material resulting from this system, will not be perpetuated.

The next important reform undertaken was the establishment of a system of registration of vital statistics. As before referred to, the original act of assembly provided for a registration of deaths.

This record being of no value for sanitary or statistical purposes, the necessity for reliable information was each day becoming more apparent and imperative.

In compliance with an expressed wish, an act of assembly was passed at the session of 1870, providing for a complete and systematic registration of marriages, births and deaths. This act was modeled, in many respects after that of the city of Philadelphia. Its provisions are very comprehensive and cover the most important items of information necessary to the compalition of statistics which are of value not only to the sanitarian and statistician, but to the general public. In this respect, the reports on vital statistics issued by the board of health since 1873 have been regarded as models of excellence, and been referred to by many of the most prominent vital statisticians of the country.

The nomenclature adopted and used in the classification of diseases, is that of the Royal College of Physicians and Surgeons of London, with some slight modifications.

A strict enforcement of the requirements of the registration act has resulted in obtaining a record of at least ninety-five per cent of the mar-

riages performed, seventy-five per cent of the children born, and what is believed to be a complete record of the deaths.

We are of the opinion that this showing will compare very favorably with that of most other cities.

After due consideration, it was determined that in order to more effectually protect the public health, a complete revision of the laws enacted for that purpose was an absolute necessity.

The original act, together with the various supplements thereto, passed as the exigencies required, had become very cumbersome and complicated; indeed, was much like a boy's celebrated pants "patch upon patch, and a hole in the middle." In consequence, an act was prepared, entitled "An Act to revise and amend the health laws of the city of Pittsburgh," which act was passed at the session of 1872. In many respects it was modeled after the health law of the city of Chicag. It very greatly enlarged the powers and duties of the board of health, provided for the appointment of additional officers and employees, and prescribed their duties.

The small-pox epidemic of 1871-2 found the working force of the board entirely inadequate to successfully combat it. A corps of sanitary inspectors was at once organized for special service, under the direction of the health officer.

The success attending these appointments was so gratifying, that the system was continued permanently, and is still in force, the city being divided into districts and an officer assigned to duty in each. Most of those now in service have been so employed for a number of years and from long experience and careful training, are well qualified to perform their duties.

As before referred to, small-pox prevailed quite extensively in this city during the years 1871-2. It was also quite prevalent in 1874-5, and again in 1881-2. Prior to 1875 the board of health was compelled to rely upon the limited accomodations of Mercy Hospital and the Pittsburgh Infirmary (both private institutions) for the care of small-pox patients, and it was only upon the most urgent solicitation that they consented to admit them. They claimed, and very justly too, that it was endangering the health and lives of the other inmates to admit such cases, a risk which the city had no right to ask or expect them to assume. During the prevalence of the disease in 1872, these institutions served peremptory notice on the board that in future they positively would not admit such patients. The board of health had frequently urged upon the city councils the imperative necessity of making proper provision for the care of such cases, but without avail. The Act of Assembly of 1872, previously referred to, authorized the board of health to provide, by purchase or otherwise, a suitable site or building for hospital purposes. The board was exceedingly desirous of availing itself of the power and authority thus vested, but owing to the refusal

or neglect of councils to provide the necessary funds, it could do nothing.

However, a knowledge of the existence of such a provision in the law, coupled with the peremptory notice form the hospitals referred to, and which had been transmitted to councils, served to create in them an unusual interest in the subject.

They at once appointed a special committee of five to confer with the board of health relative to the establishment of a small-pox hospital. This action finally resulted in the purchase of four and one-half acres of ground in the Thirteenth ward during the year 1874, and the erection thereon in 1875 of a frame hospital building, capable of accomodating about fifty patients. Additions have since that time been erected, so that the present capacity is sufficient for the accomodation of from eighty to one hundred.

The advantages derived from such an institution need not be dwelt upon in addressing a body of gentlemen possessing such extensive experience in the prevention and treatment of such diseases, but suffice it to say that but for its existence, the various outbreaks of small-pox which have occurred since its establishment, would have been much more serious, and the loss of life resulting therefrom very greatly augmented. A comparison of the mortality among those treated in the hospital, and those treated at home, has always been largely in favor of the hospital treatment.

Under the provisions of the Act of 1872, and the amendment thereto passed in 1883, physicians are required to report forthwith, all cases of small-pox or varioloid, diphtheria, scarlet-fever, typhoid-fever, typhus-fever, yellow-fever, cerebro-spinal fever, or Asiatic cholera, which may be under their care.

Upon receipt of such report, a sanitary policeman is at once sent to the infected house or locality, and a thorough inspection and report made. If small-pox, the importance of immediate removal to hospital is urged. Under certain circumstances and conditions as set forth in the Act, such removal can be compelled. In any event the house and premises are carefully guarded, and after the recovery or death of the patient, the infected bedding and clothing are destroyed, and the apartments thoroughly disinfected and fumigated.

A regulation of the health bureau provides that children shall be excluded from attendance upon any school: either public, private, or parcohial, unless they present a certificate signed by a physician, setting forth, that, of his own knowledge, said child has been successfully vaccinated, provided it has not already had small-pox.

Another regulation provides that children who have been suffering from small-pox, scarlet-fever or diphtheria, or who may reside in the house where any of said diseases have existed, shall be precluded from attendance upon any of the schools until thirty days have elapsed after

the convalescence or death of the person last affected; this to be certified by the attending physician, or the physciian of the bureau of health.

During the past year an attempt was made to induce city councils to incorporate in an ordinance the foregoing provisions, as well as one regulating the funerals of the persons who may have died of any of the aforesaid diseases, but failed for lack of a legal majority. It is hoped, however, that said regulations will, in the near future, have the additional force of municipal law.

When the condition of the appropriation justifies the expenditure, the city is divided into districts and a corps of vaccine physicians appointed.

They are required to carefully canvass their respective districts and tender gratuitous vaccination to all who are unprotected and who may be proper subjects for such gratuity.

In the performance of their duties the vaccine physicians are governed by the following rules:

a. To use strictly pure and fresh animal (bovine) vaccine (which will be furnished at cost price at the office of the bureau of health).

b. To employ a surface by scarification (which is preferred) that shall embrace two points each not less than one-third inch square in extent; one or both arms or legs to be taken and an entire quill or its equivalent to be used on each person.

c. To examine at the lapse of proper time each person whom they vaccinate and ascertain the amount of success which shall be reported to the superintendent of the bureau of health together with the name, age and residence of the individual vaccinated.

d. To vaccinate unprotected individuals and of such those alone whom circumstances have made proper subjects for this charity so far as possible by careful inquiry can be ascertained. Each physician shall before presenting his statement certify under oath that the foregoing rules have been strictly complied with.

e. The compensation of the vaccine physicians shall be at the rate of fifty (50) cents for each vaccine mark made as described in clause "*b*" of this rule; *provided* that only successful vaccinations shall be charged for and that the cost in any case shall not exceed fifty cents for each successful sacrification.

In common with most other cities Pittsburgh still wrestles with that most important sanitary question viz. "What shall we do with the garbage."

Until the advent of natural gas it was a problem easily solved by those who had the disposition to do so by destroying it in the ordinary kitchen stove. While some did so the majority deposited it in their yards, cellars or ash-barrels and had it removed at regular or irregular

intervals, frequently at the urgent *request* (?) of some of the health officials and deposited it at some scarcely less objectionable locality.

During the year 1887 the board of health determined to attempt the destruction of this material by fire. A furnace for that purpose was erected at an original cost of three thousand dollars and has been operated quite steadily since that time. Coal slack coke and natural gas have been used as fuel at intervals, gas being used at present. The consumption of the material is quite perfect the amount consumed during the summer season averaging some sixty tons per twenty-four hours. For the proper and prompt disposal of all garbage of this city at least four additional furnaces of the same style and capacity would be necessary. This method is however regarded as being too expensive, thus leaving the economic portion of the problem unsolved.

Dead animals are removed, as during the past ten years, by contract; the cost at present being twenty-seven hundred dollars per annum.

Prior to 1886, the cost of removal was considerably less than the above amount. During that year much litigation was indulged in by the residents of the neighborhood in which the place of final disposal was located. This being a subject with which some of the members and officers of the State Board of Health are quite familiar, an extended reference to it is unnecessary.

It is sufficient to say that the animals are now removed to, and disposed of at a point situated on one of our railroads, some sixteen miles distant from the city. During the heated term they are conveyed thither in refrigerator cars. At present the service is quite satisfactory.

Pittsburgh's natural advantages as regards drainage, are of no mean character, upon the contrary, they are first class.

Unfortunately, however, until within the past ten or twelve years, her authorities and people depended quite too much upon natural advantages. Except in the most densely populated portions of the old or original city, but little attention was given to artificial drainage and sewerage.

Several severe outbreaks of diphtheria and other filth diseases have been unerringly traced to this neglect.

I am happy to be able to say, however, that during the past ten years, and at the present time, rapid strides in the direction of thorough and systematic drainage and sewerage have been taken which although not nearly completed, have already had a decidedly beneficial influence upon the health of the community.

Pittsburgh's water supply is derived from three sources. That for those districts locally known as the "Old City" and East End," is obtained from Allegheny river, a swift and comparatively clear stream, at a point within the city limits, but at a distance of about four miles above the business portion of the city, and beyond the principle sources of contamination.

Scientific tests indciate that the water obtained from this source is of an excellent quality. So far as human foresight can determine, it is likely to remain so for a number of years.

As much cannot be said, however, of that furnished the people resid ing in the district known as the "South Side," and situated on the south banks of the Mononaghela and Ohio rivers.

The principal water supply of this district is obtained from the Monongahela river, a sluggish and murky stream, flowing through an alluvial formation, and obstructed bynumerous dams. The point at which the supply is procured is situated at the foot of south Thirtieth street, some twelve blocks above dam number one. Consequently, the water is obtained from the almost stagnant pool resulting from said obstruction.

While in its natural or primitive condition, the water of this stream is comparatively pure, yet on account of the obstructions referred to, and the fact that it is the catch basin for the filth of at least sixty thousand of a population distributed along its banks for a distance of forty miles, its value as a source of pure water supply is greatly diminished.

An epidemic of what was termed typhoid fever, for lack of a better name, occurred in this district during the summer and autumn of 1887, and was, after careful investigation, traced to this cause.

Especially during a season of low water and high temperature, which condition prevailed at the time referred to, is the danger arising from its use most pronounced. Unfortunately for the welfare of the residents of this locality, city councils about three years since, concluded a contract with the Monongahela Water Company for furnishing this quality of water for twenty-one years longer.

For additional information regarding the outbreak of fever referred to, and the very thorough investigation as to its cause, permit me to refer you to the comprehensive report of a special committee appointed by the late board of health, and submitted to it in December of 1887, a copy of which was forwarded to your honorable body, and which is now being published in connection with the annual report of the board of health for that year.

The third source of water supply is that obtained from numerous wells and springs existing principally in the East End and South Side districts.

The use of this supply is mostly confined to the latter district, especially when the public supply obtained from the Monongahela river is rendered unpalatable on account of freshets, or continued drought. That the supply obtained from springs, and especially from wells located in a thickly populated locality is at all times dangerous, or at least above suspicion, has a number of times been clearly demonstrated in the district mentioned.

Many of the most dangerous of them have been abandoned by order

of the sanitary authorities, after due and proper qualitative tests have been made.

In 1888, the office of meat inspector was created, and the duties prescribed by ordinance of councils. It provided for his election by councils, and that he should report to the board of health. Otherwise, the office was not connected in any way with said board, nor had it any control over him.

This arrangement, or combination, not proving satisfactory, a change was decided upon, which was effected by a provision in the Act of 1872, directing that the meat inspector should be elected by the board of health. It also further defined and extended the scope of his duties. This was again amended by the Act of 1873, which imposed upon the meat inspector the additional duty of inspecting dairies and milk. These duties, together with those pertaining to the inspection of meat and cattle, are performed quite as well as can be expected of one inspector. He is clothed with the power to both condemn and confiscate.

The death rate of the city of Pittsburgh for the past fifteen years, will compare favorably with that of sister cities of a corresponding population, (estimated at the present time to be 230,000.)

The rate per thousand during that period was as follows:—

YEAR	RATED.
1874	24.68 a.
1875	21.12
1876	20.39
1877	23.50 b.
1878	21.1
1879	19.49
1880	21.8
1881	27. c.
1882	24. c. d.
1883	19.
1884	20.
1885	18.96
1886	20.6
1887	22.4 d.
1888	19.

a. Scarlet fever prevailed.
b. Diphtheria prevailed.
c. Small-pox prevailed.
c. d. Small-pox and typhoid fever prevailed.
d. Typhoid fever prevailed.

In justice to the memory of the late board of health, I cannot close this history without a reference to the personnel of a portion of its membership, and officers, to whom so much of the efficiency of its working

force was due. In addition to those gentlemen already referred to, special and honorable mention must be made of some of the members ofthe medical profession, viz: Drs. McCandless, Arthurs, Arnholt, Gilmore, Graham, Asdale, McCann, Thomas, McCord, Dunn and Green; of the legal profession, Messrs. Slagle, McCormick and McFarland; of the business community, Messrs. House, Hays, Fleming, Brush, Logan, Voetter, Reitz, McCullough and Jones, all gentlemen standing high in their chosen profession, or business circles and who for many years served their fellow citizens faithfully, "without money and without price," having no other hope of reward than the consciousness of having performed their part in saving human life and diminishing human suffering.

Some of these have been called hence by death, and I doubt not are now residents of a city in which the sanitary, as well as all other conditions, are perfect. Others are still with us occupying high and honorable positions on bench, in bar, professional chairs, and in the business community, but yet who evince a deep interest in public sanitation.

At the legislative session of 1887-8, a new charter for the city of Pittsburgh was enacted, and went into effect February 1, 1888.

This marked the beginning of another era in the history of the sanitary department of the city government, as well as all others.

It provided with the abolition of all boards and commissions, and vesting their power and authority in departments, and sub-divisions thereof, to be known as Bureaus.

To the Department of Public Safety was confided "the care, management, administration and supervision of police affairs, and all matters relating to the public health, to the fire and police force, the city telegraphs, and the inspection of buildingps, including plumbing, gas-fitting and house drainage."

It provided for the creation of a bureau to be known as the Bureau of Health, to consist of a superintendent, and such other officers, clerks, &c., as might be found necessary to fully carry out the objects of its creation.

Thus the old health department was abolished, and all its powers, authority and duties were vested in the newly created Department of Public Safety and Bureau of Health, which transfer was effected on February 1, 1888.

During the following month the writer's direct connection therewith was severed, by reason of his promotion to a position on the personal staff of the Chief of the Department of Public Safety.

The present working force of the health bureau consists of a superintendent, chief clerk, physician and registrar of vital statistics, registration clerk, meat and milk inspector, vegetable inspector, chief san-

itary inspector, ten sanitary policemen, steward of municipal hospital and six employés at garbage furnace.

The appropriation for the present year is $39,500. The efficiency of the bureau is excellent, and compares very favorably with that of similar organizations in other and more pretentious cities.

To you, gentlemen of the State Board of Health, the Department of Public Safety and Bureau of Health, look for guidance and support.

They trust that the many valuable lessons in theoretical and practical sanitation taught by you in the past, not only through the personal efforts of yourselves individually, and of your board as an aggregation, but through the medium of these sanitary conventions, all of which so greatly tended to assist and strengthen the hands of the old board of health, may be vouched to them.

In conclusion, the Department of Public Safety through me, extends to all of you a cordial greeting to the "City of Natural Gas," and also tenders a word of comfort and advice.

During your probably extended sojourn in our midst, should you unfortunately contract any of the diseaes referred to, its health bureau will promptly convey you to a proper haven of refuge, and carefully tend and nurse you back to health.

Should you discover any disagreeable odors arising from defective plumbing, its inspector of plumbing, gas-fitting and drainage, will be at your service.

Should you desire to indulge in liquid refreshments, you will doubtless be compelled to do so in "Homœopathic" doses, as, thanks to our license court, the number of places where said refreshments can be legitimately obtained, has been reduced to but ninety-three in number.

This, of course, does not include an occasional "speak-easy" which might possibly be discovered by means of the microscope, which you are all supposed to be supplied with. However, should you succeed in securing the quantity necessary to cause any evil effects, its police bureau will take great pleasure in providing a proper and gentlemanly escort, and conduct you to a temporary place of abode. Should you become exhausted to such an extent as to require heroic treatment, its bureau of Electricity will be called upon to treat you "Electropathically." If this should fail of the desired effect, "Hydropathy" might be resorted to, through the medium of the fire bureau, which would take great pleasure in administering "Allopathic" doses of aqua pura, freshly drawn from the Allegheny river, or to use another, and probably slang phrase, "turn the hose upon you."

The CHAIRMAN. Remarks upon this paper are in order.

Dr. LEE. It is probable that the members of the State Board of Health, and myself as Secretary, have listened to this history of sanitation in Pittsburgh with more interest than the audience generally. To me I confess it has been a paper of great interest and value, and I

am certain that when it comes to be printed in our Report, will be read with still more interest than it has been listened to.

I desire, as I am in a position to speak with authority, to say that the registration of vital statistics in this city is on the whole superior to that in any city in the State, that the reports which are received monthly by the State Board of Health upon this point, are more systematic in their arrangement and of more use to the sanitarian than those of any other city. And as I have already remarked here the system of notification of infectious diseases is far in advance of any other.

I am also led to think from observations of epidemics of small pox here that their dealing with such outbreaks is more peremptory than in any other place. The great difficulty in dealing with these outbreaks, especially small-pox, is that the patient, and the patient's friends, object to their removal to where they will not only be carefully treated, but the community will be safe from infection from them as a center. Consequently precious time is lost and before the city has resolved upon a removal to a special hospital, centers of infection have been established in perhaps half a dozen different places.

This was the history of the epidemic of small-pox in Philadelphia about a year ago; this was the history of the epidemic which is still in existence in the town of Nanticoke, and this will be the history in every town which does not imitate Pittsburgh, and deal forcibly and peremptorily, at the outstart with all epidemics of this kind.

An allusion was made to one of the sources of water supply of this city. I confess that it passes my comprehension how such a franchise could possibly have been given (as Mr. Gray tells has been given) to the Monongahela Water Company to supply people with stuff like that for 31 years to come. I have examined the shores of that stream at different points, and if I were to describe to you the festering masses which I have seen lying rotting upon the banks of the stream ready with the first shower to be swept down and become mingled with the water supply of the South Side, it would turn your stomachs. I can only say in regard to it, that a gentleman who was making the investigation with me, as he looked down upon this horrible mass remarked, "there's millions in it," and so there were.

The CHAIRMAN. Gentlemen of the State Board of Health: I desire to make a few remarks in reference to the subject before the convention. As a member of the legislature of the eastern part of the State, I had the honor at the last meeting of the legislature, of being appointed on the committee of Health and Sanitation. Having been thus appointed, I felt an interest which has brought me here to this convention and I have listened with pleasure to the many papers which have been read on the subject of health and sanitation; and I have been struck with the absence of any reference to those to whom we owe so much, to

those who could aid us, and who do aid us so much in every pursuit in life—woman.

As a director of the public schools for many years, I was gratified when the introduction into the schools of physiology and hygiene was made. I watched the progress of that study, more particularly among the girls, from the fact that they need it from the life that is before them, more than the boys. I watched the study with great interest, and I confess, I have heard them enumerate the various organs of the human body just as clearly and as distinctly as I have ever heard it done in a medical college. They became interested in it, and I feel sure that it will be of great assistance to them in the life that is before them.

I think we owe much to the women, and we ought to endeavor to enlist them in this cause that we have been talking of for two days. What would the social circle be without her charming influence? What would the sick chamber be without her gentle administrations? How well the physician knows the value of a good nurse in a sick chamber! She exposes herself to infectious and contagious diseases in the hospital, and you will find her upon the battle field ministering to the wounded and dying. Truly the poet says:

Oh, woman, in her hours of ease
Uncertain, coy and hard to please;
When pain and anguish wring the brow
A ministering angel thou.

One of the poets of the present day pays a tribute, and a just tribute, to woman when he says,

The bravest battle that ever was fought,
Shall I tell you where, and when?
On the maps of the world you will find it not!
It was fought by the mothers of men.

Not with cannon or battle shot,
With sword or nobler pen,
Not with the eloquent word and thought
From mouths of wonderful men.

But deep in a walled up woman's heart,
A woman who would not yield,
But bravely, silently bore her part;
Lo! there is that battle fought.

No marshalled host, no bivouac song,
No bannered column wave,
But O! these battles they last so long,
From childhood to the grave.

The CHAIRMAN. The next paper to be read is a review of the laws of the various states, relating to contagious diseases among domestic animals, by Dr. Charles McIntire, Jr., whom I now have the pleasure of introducing to you.

Dr. McINTIRE. Mr. Chairman, Ladies and Gentlemen, I have a very high estimate of and I know the esteem with which our domestic animals are held in the country, and the value that is placed upon them. Indeed I am reminded of a patient of a famous Western physician, who asked her doctor if he would perform some slight surgical operation upon her pet dog. He asked her why she did not go to a veterinarian, "Oh, Doctor, they charge too much," was the reply, "and I think sir, you will be able to do it."

I havn't been able to see, but I am of the impression, that the legislature of this great State at its last session has appropriated more money for the care of the domestic animals within the State, than it has given the State Board of Health to look after the health of the people of the State.

But notwithstanding, sir, I know so much about the esteem in which domestic animals are placed I hope, that no one of you think I propose to show my esteem of the magnitude by the quantity of the manuscript which I have in my hand to give to this convention. Indeed, sir, the language of Lord Dundreary would not apply to this case for the tail would wag the dog, the appendix is much the heavier part of the paper, and for your own, and for the good of the friends that are here, I will say that the greater part of this is entirely harmless, and will not go off at all.

A REVIEW OF THE LAWS OF THE VARIOUS STATES RELATING TO CONTAGIOUS DISEASE AMONG DOMESTIC ANIMALS; WITH SPECIAL REFERENCE TO GLANDERS.

By CHARLES MCINTIRE, Jr., A. M., M. D., *Lecturer on Hygiene, Lafayette College, Medical Inspector, Lehigh District.*

Last year I received a ponderous envelope from the Executive Office of the State Board of Health, and found, from its contents, that I had been honored with the appointment to an inspectorship. I immediately had myself vaccinated, as there was some small-pox not very far away, and if duty called I must obey. For some time the chief duty connected with the office was dreaming, day dreaming of sanitary surveys, and of if inspections, sharply ferreting out hidden sources of pollution to the benefit of mankind and the diminution of doctor's incomes. By and by the first order for service came; alas! for my airy castles, it was to go to Stroudsburg and shoot some horses because they were glandered. The good secretary fearing I might not be a marksman kindly instructed me, in a private letter, that I had better employ a constable to do the shooting, but that I must certainly look on. I obeyed these instructions in part, going to Stroudsburg but neither *per se nor per alia* did I shoot the horses. Since my disobedience was fully sustained at

head-quarters, there is no need for defence of the action, nor would the incident be worth the reference were it not that the legal difficulties that barred the progress, and the amount of labor necessary to prevent some of these horses carrying the disease to the neighboring stables when the owner was averse to destroying the animal suggested to the Secretary this compilation and review.

In order to procure the data for this paper a letter was sent to the secretary of every state board of health, and where there is no state board of health, if a proper officer was known inquiry was made of him. For the most part the letters brought prompt and satisfactory replies, and I desire to express my thanks to these gentlemen for the pains they took to furnish the information asked. With some of these replies were sent copies of the laws, others, abstracts more or less full: I have endeavored to arrange these laws and abstracts, alphabetically by states in the appendix.

In our review of these laws, let us endeavor to bring out their salient features by asking questions, and first, under whose auspices are the laws executed.

The laws are under the direction of the state board of health in Kentucky, Minnesota, New Jersey, New York, Rhode Island and West Virginia. In Iowa there is a state veterinarian, who is an additional member of the state board of health, to whose special oversight the execution of these laws is given: in Wisconsin there is also a state veterinarian, working in harmony with the state board of health using the local boards of health to enforce quarantine, etc.

Louisiana has no laws at all upon the subject.

In California, Connecticut, Pennsylvania and South Carolina the execution of the laws is made a part of the duty of the State board of agriculture; while in the other states from which information was obtained there is a special board or commission having oversight of the live stock interests of the state. These are variously named, in Arizona and Kansas it is the "Live Stock Sanitary Commission," in Illinois, the "Board of Live Stock Commissioners;" in Maine and Vermont, the "State Cattle Commission:" in Maryland, the "Live Stock Sanitary Board;" in Massachusetts, and New Hampshire, the "Board of Cattle Commissioners;" and in Michigan, the "Sanitary Live Stock Commission."

There might be theoretical objections to each of these bodies, and the least evil to be chosen would depend largely upon local conditions. On the other hand either form of organization is capable of good work, and testimony has been received from states representing each form, of the efficient execution of the law. It would seem well that where there is already a board of health, and a board of agriculture established in a state the care of the domestic animals should be the duty of the latter board, as was done by our last legislature. It might have been an im-

provement in the wording of this law had the care been given to the board directly and not to the secretary in apparent independency of the board. A strict construction of the law, in the hands of some one less able than the present efficient secretary might cause a lack of harmony in the deliberations of the board. It was evidently thus formed to place the execution of it in the same hands that now executes the former laws, then preferably the execution of the law should have made it the Governor's duty to harmonize with them, for, should it not please some future Governor to make the secretary of the state board of agriculture his special agent to execute these laws, there would be one person to look after the diseases provided for by law, and another for those not so provided with a possibility of clashing authority.

Second. Is glanders specifically mentioned, or are the laws general in their phraseology applying to all contagious diseases among all domestic animals? Arizona, Kansas, Maine, Pennsylvania, Vermont, and possibly, South Carolina make no specific mention of glanders: Pennsylvania however includes the disease under the wording, "contagious diseases not otherwise provided by law." In the other states there is some indication of the disease being included in the province of the act; unless there is a separate act. This seems to be the better way since the greater relative value of horses, the possibility of using an animal affected with chronic glanders, and other questions arise where equity seems to demand separate rules for the different classes of animals.

Third. Does the law give power to kill the diseased animals? Here it is more difficult to make a simple tabulation of the various acts, as in some cases the catagorical "yes" or "no" would not convey the precise truth. In Arizona, Connecticut, Indiana, Maine and New Hampshire, there seems to be no such authority given by the statute. Some of the secretaries of the boards of health deplore this fact. As to Kansas, I am somewhat doubtful as to the interpretation of the law, I should think that they have not the power to cause glandered horses to be slain; the law gives power to appraise and kill, and afterward limits the diseases for which an animal can be appraised. While there is no power to enforce the suggestion in Connecticut, the owner's life can be made miserable in endeavoring to care for the animal legally, so that only the excessively obstinate would not yield to a request from the proper authorities.

All the other states reporting, give the authority to cause to be slain. They all take due precaution to have the fact of the disease substantiated, this done, there are various methods of compelling to obey. In California, Kentucky and Rhode Island the owner must cause the animal to be put to death or suffer the penalty for his neglect, in Illinois, if the owner neglects to obey the mandate of the board, the animal is killed by the authorities while the owner forfeits all claim to an appraisal that had been made. In West Virginia the power to cause

to be killed rests with the county courts: in the remaining states, the destruction of the animal is done under the direction of the officials charged with the execution of the law.

One cannot conceive that there exist any doubts of the propriety of killing any animal affected with a highly contagious disease, and incurable withal. The only precaution necessary is the certainty of the diagnosis, and too much precaution can not be taken to be sure of this. Of course in the majority of cases the diagnosis can be made with certainty, but in the minority, where the veterinarian is not positive, if the disease is present, the liability to communicate it will be as great as it would were the disease undoubtedly present: while, on the other hand, valuable animals might be destroyed uselessly. To prevent this the skill of educated veterinary surgeons is uniformly brought into use, and in some states, as Rhode Island, the owner is privileged to isolate the animal until all sources of doubt are removed. Whether the fact is especially mentioned or not, there is a provision in all the laws which will permit of pre-determining all cases of doubt, that is, the power to quarantine. This power is variously given in the various enactments, in some it takes the form of prohibiting the owner from using the animal anywhere off his own premises, as in Indiana and Connecticut, through all grades of rules up to the power of removing all suspected animals to some place provided by the authorities, and kept there at the joint expense of the town and state, as in Massachusetts. Clearly for glanders, quarantine should be used only for the purpose of observing those animals in which the disease has not certainly manifested itself, and those who, having been exposed to the contagion, should be under observation until they can be pronounced free from the possibility of the disease from that exposure. Who should be at the expense of the maintenance of the quarantine can be better discussed after the discussion of the next question, i. e. that of appraising and paying for the animals slain.

A very superficial examination of the various laws, rules or regulations will show that the law-makers were influenced by varied opinions in arranging for the appraisal of diseased animals, for there is a great diversity. In some states there is no appraisal, in others horses are specifically excepted from the action of the act, and still in others appraisals are permitted only for certain diseases. It would be tiresome to enumerate these differences here, nor would a tabulation be much shorter than the clauses in the laws themselves. Reference only will be made to the provisions regarding glanders. Arizona, Connecticut, Indiana, Iowa, Kansas, Massachusetts, Minnesota, New York, Rhode Island and possibly Maine make no provision for the appraising the value of glandered animals. In Maine the law says: Animals affected with said disease (Tuberculosis-pneumonia, foot and mouth disease, and *any other infectious or contagious disease*) and to pay, in case of

diseased animals, the owner or owners thereof three-fourths of their value upon the basis of health before infection, and the full appraised value in case of animals exposed to either of such diseases, but not themselves actually diseased."

In California, some of the counties make appropriations so that payments can be made. In Illinois appraisals shall be made at a fair cash value, but horses are not to be valued above one hundred dollars a head. In Kentucky cattle may be purchased if exposed to infection and not yet diseased, and by enactment, cattle include horses. In Maryland, and Michigan appraisals are to made of the value at the time of appraisal, but in New Jersey, of the value just prior to becoming diseased, limiting the value to one hundred dollars for registered cattle, and forty dollars to others: this may possibly not refer to horses. In Ohio the appraisal is made for chronic glanders in those cases "which may be adjudged capable of rendering some service." In Pennsylvania the appraising shall indicate the value at the time of appraising, while in Wisconsin the warrants are issued for two-thirds the value, and not to exceed fifty dollars.

In view of this conflicting practice, what is the proper thing to have done? The question seems to involve several considerations: for some states, while recognizing the propriety of paying for animals slain, adjudge a glandered horse of no value whatever and therefore no appraisal need be made. Others maintain that the diseased animal is a nuisance and a menace to the rights of others, so that the owner is bound to abate the nuisance at his own expense. Looking at it from one side, it is the police power of the government using ones property for the public good; from the other view, it is the majesty of the law compelling every man to live at peace with his neighbor. There are still other considerations, how can the end desired best be brought about? Without a knowledge of the cases neither the law's majesty, nor the powers of the police have any effect, and it is argued that the payment of a fair or proportionate value will cause the reporting of the disease, the slaying of the animal and the disinfection of the premises; thus saving and serving the body politic. Precautions must be taken to prevent frauds being perpetrated, useless animals exposed to the disease, diseased animals brought into the state, etc., if there is not this inducement to report there must be penalties prescribed for not reporting. Leaving to the lawyer to decide which is the more scientific from a legal standpoint, it does seem that the payment of the value of the animal would conduce to the most efficient execution of the law, since it would be more apt to secure the co-operation of the owners: and if so, the rule in Ohio seems to be a wise one, that the appraisal be an estimate of the probable value of the services of the animal to the owner.

But as to quarantine, if we believe that all glandered horses should be promply killed and burned or buried, which I think we ought to be-

lieve, not only on account of the risk of communicating the disease to horses, but also on account of the perpetual danger of infecting man; if we so believe there is nothing but the weakness of the law, or inefficiency in the execution, that prevents its accomplishment. Hence the owner who will not permit his horse to be killed ought himself to bear all the inconvenience and expense of the quarantine, as well as the risk of damages for communicating the disease to other animals. But in cases of doubt, or where there has been exposure without present development of disease, it would seem to be a police measure for the public good, for which the state should not only pay the expense but the law of Connecticut as to neat cattle should be followed, that "actual pecuniary loss caused to the owner by quarantine" shall be paid to him.

There remains only to consider the penalties attached for non-compliance with the law. These have been classed as the refusal to obey the orders of the authorities, or refusal to permit the officials making the necessary inspections, the selling or using illegally, animals diseased, exposing sound animals to contagion, and bringing animals knowingly diseased into the state: this last is made the most heinous: in Kentucky, it is a felony. Most of the laws specify the violations as misdemeanors, punished with fines simply, or imprisonment, or both; and where there is a law for payment of value, the forfeiture of this. In Kentucky and Ohio the owners are liable to all civil damages as well, the same is probably true as a principle of common law.

With a wise law proposing an equitable payment for the probable amount of service the animal can give to the owner, discreetly executed, the penalties should be severe, and I am inclined to agree with the secretary of the State Board of Agriculture of California, that it should be a felony rather than a misdemeanor. Which is more heinous, to poison a public drinking trough with arsenic and your horses die, or with the germs of glanders and they catch an incurable disease—if I burn down a livery stable, or infect its stalls with farcy germs? Let the law be fair so as not to impose unnecessary distress upon the owners of horses, and let the penalty be sharp and decisive as the danger of the case requires.

Having thus reviewed the salient features of the laws coming under our notice, there remains a recapitulation to gather what may seem to be the better features of all the laws. The execution of the laws should be entrusted to the care of some person or persons, whose duty it is to see that they are enforced. A cattle commission, board of agriculture, or board of health in the order named, if in existence seems to be the proper body for this purpose; if either exist, a separate board for this duty solely does not seem necessary. The law should indicate beyond a doubt that diseased animals of the equine species are included in its provisions, mentioning the disease is not necessary if it is otherwise clearly stated.

Full care should be directed for an accurate diagnosis, for which a quarantine at the expense of the State should be maintained for all suspected cases. Animals about which there is no doubt should be appraised, being the probable amount of work the animal would be able to do for the present owner, and the animal promptly killed. If the owner by any means prevents this, have a strict quarantine at the expense of the owner, and make him liable for all damages that result. Any man selling a horse knowing it to be glandered, or using one in such a way as to make it liable to communicate the disease to another animal should be guilty of a felony, and on conviction punished accordingly.

APPENDIX.

Copies of the Laws or Abstracts of Laws upon which the Review is based.

Rules and Regulations of the Live Stock Sanitary Commission of the Territory of Arizona. Adopted at a regular meeting held at Phœnix, Arizona, February 8th, 1889.

In pursuance of an Act of the Legislative Assembly of the Territory of Arizona, "An Act for the Protection of Domestic Animals," approved the 10th day of March, 1887, and of Section Three of said Act, the following rules and regulations are hereby prepared and adopted for the protection of the health of the domestic animals of the Territory of Arizona from contagious, infectious and communicable diseases, and shall be in force and effect after June 1st, 1887, until further notice.

First. Whenever it shall come to the knowledge of any member of the Live Stock Sanitary Commission of the Territory of Arizona, or to the knowledge of any other person or persons, that there exists any contagious, infectious or communicable disease among the domestic animals in any part of the Territory, he or they shall at once communicate the fact to the Territorial Veterinary Surgeon, A. J. Chandler, at Phœnix, Arizona.

Second. Said veterinary surgeon shall immediately proceed to the locality where the disease is believed to exist, and make an examination of the animals said to be affected with the disease. If, in his judgment, the case demands immediate action, the veterinary surgeon shall communicate by telegraph or mail with each member of the commission, or as many thereof as he may deem necessary, designating the place of said meeting.

Third. Should the said veterinary surgeon on such investigation find that a contagious, infectious or communicable disease exists among the domestic animals examined, and especially any disease of a malignant character, he shall direct the temporary quarantine of said animals and the herds among which they are, and adopt such sanitary measures as may be necessary to prevent the spread of the disease, and report his action, as heretofore provided, to the commission. He shall further

notify in writing, the owner or owners, or the custodians of such animal or animals, of the existence of the contagious disease, and that said animal or animals have been placed in quarantine, and warn him or them from moving said animal or animals under penalty of Section 13, of Chapter 3, Title LIX, of the Revised Statutes of Arizona.

Fourth. When said Live Stock Sanitary Commission is satisfied of the existence of any contagious disease among the domestic animals of any part of the territory, and that there is danger of said disease spreading to other portions of the territory, it shall notify the Governor thereof, who will quarantine such locality as provided by law. Such quarantine of all diseased animals, and all animals that have come in contact with diseased animals, or have been on premises or in buildings on or in which such animals have been exposed to disease, shall be for such length of time as may be deemed advisable by the territorial veterinary surgeon, and shall be governed by such other sanitary regulations as the exigencies of the case may require. Under the direction of the commission, he shall cause to be disinfected in such manner as he deems best, all sheds, corrals, yards, barns and buildings in which diseased animals have been confined, and until such premises and buildings have been so disinfected and declared free from contagion by a certificate in writing signed by the veterinary surgeon, no animal or animals shall be permitted to go upon or into said premises and buildings. Should, however, any animal or animals be put upon said premises or into said buildings, in violation of this rule and regulation, then such animal or animals shall be placed in quarantine for a period of not less than 90 days, and such premises and buildings be again disinfected. Said disinfection to be at the expense of the owner or owners of said premises or buildings.

Fifth. All animals in quarantine or actually affected with disease shall be marked, for the purpose of identification, by having the hair of the tail cut as close as possible and a guard put over them; and a record shall be kept showing the character of each animal, mark of identification, name of owner, locality and date of quarantine; and all animals quarantined shall be deemed and considered as "Affected with contagious diseases." And any person or persons moving said quarantined animals from the infected district shall be prosecuted under Section 13, of the Chapter and Title of the Revised Statute, of Arizona, heretofore referred to.

Sixth. Whenever, in the judgment of the commission, it becomes necessary to kill animals that have been affected or exposed to the contagious diseases known as pleuro-pneumonia or foot and mouth disease, in order to prevent the spread of said diseases in the territory, it shall cause the same to be slaughtered and the hides and carcasses burned; and it shall be the duty of the commissioners to appraise the animal or animals to be killed as to their value at the time of their condemnation;

and there shall be issued to the owner of the live stock so killed a certificate signed and properly verified by a majority of the commission showing the number and kind of animals killed, and the amount to which the owner is entitled; and upon presentation of such certificate to the territorial auditor, he shall draw his warrant on the territorial treasurer for the amount therein stated as provided by law; provided, however, that the provisions of this rule shall not apply to any animals killed by order of the commission, which have been brought into the territory in a diseased condition, or which have been brought from any section infected with contagious cattle diseases, or which have been brought into the territory in violation of any quarantine regulations thereof.

Seventh. It shall be the duty of all railroad companies, before entering the territory with any horses or cattle, to inform the territorial veterinary surgeon of the state and county from which the stock are shipped, the name of shipper and the locality within the territory to which they are destined, and said veterinary surgeon shall instruct the railroad company either to forward the shipment or hold for a personal inspection, should one in his judgment be necessary, and should the stock come from an infected district, which would render them liable to communicate an infectious or contagious disease, the territorial veterinary surgeon shall have them placed in quarantine till all danger of infection is passed.

Eighth. The territorial veterinary surgeon shall have full power at all times to order railroads and other transportation companies, under penalty of Section 18 of the law herein before referred to, to disinfect their stock yards, cars and other vehicles of transportation, in such manner as he deems best, and such cars and other vehicles of transportation which when declared by him in quarantine, shall not be used again to transport, store or shelter animals or merchandise until certified to be free of contagion by a certificate signed by the territorial veterinary surgeon, and such stock yards shall not again have animals placed in them until in like manner declared free of contagion. And it is especially required that all cars used for transporting cattle, either into, out of, or within the borders of this territory, shall, before being loaded with cattle, be thoroughly disinfected by such means and in such manner as the veterinary surgeon shall direct.

Ninth. No person or persons, under penalty of Section 2 of the Act entitled "An act for the protection of cattle against Texas, splenic and Spanish fever," shall, between the first day of April and the first day of December of any year, drive, or cause to be driven into or through any county or part thereof in this territory, or turn loose, or cause to be turned loose upon, or kept upon any highway, range, common or enclosed pasture within this territory, any cattle capable of communicating or liable to impart what is known as Texas, splenic or Spanish

fever, and the fact that such cattle have come from west of the sixteenth meridian of longitude west of Washington and south of the thirty-seventh parallel of north latitude, shall be taken as prima facia evidence that such cattle are capable of communicating and liable to impart Texas, splenic or Spanish fever, but the provisions of this rule shall not apply to cattle from New Mexico, California or the Republic of Mexico.

Tenth. Under instructions from the United States Treasury Department, all cattle coming into this territory from the Republic of Mexico must be inspected at the different ports of entry by the Territorial Veterinary Surgeon or his deputy, who will furnish the owner, or party in charge, upon evidence that they have come from a healthy locality and found to be free from disease a health certificate, allowing them to enter the territory.

Eleventh. The various railroads entering into the territory shall be requested to promptly notify the Territory Veterinary Surgeon, on blanks furnished by the commission for that purpose, of each shipment of cattle entering the territory over their lines, whether destined for points either within or beyond the limits of the territory.

Twelfth. The office of the Live Stock Sanitary Commission shall be at the capital of the territory and shall be under the charge of the Territorial Veterinary Surgeon, who is hereby required to furnish individuals and corporations with printed copy of these rules and regulations on application free of expense.

California.

From the Penal Code, Title 10, Sections 400-1.

400. Any person who shall knowingly sell, or offer for sale or use or expose, or who shall cause, or procure to be sold, or offered for sale or used, or exposed any horse, mule, or other animal having the disease known as glanders, or farcy, shall be guilty of a misdemeanor.

401. Every animal having glanders, or farcy, shall at once be deprived of life by the owner or person having charge thereof, upon discovery of its condition, and any such owner or person omitting or refusing to comply with the provisions of this act shall be guilty of a misdemeanor."

The secretary of the state board of agriculture, under whose oversight is placed the care of the domestic animals, writes; "In some of the counties, I believe, the supervisors have, under provisions empowering them under certain circumstances, in the general county government bill, appropriated money to reimburse owners to the extent of two-thirds the value of animals killed under this law.

"It should, in my opinion, be a felony instead of misdemeanor, as no more dangerous practice exists than the secreting of this horrible disease. It should be stamped out, or else our live stock interests will

soon be an industry of the past, for once a good foot hold is obtained for this disease, there is no calculating the loss to any community."

Connecticut.

From the "Manual for the use of Local Boards of Health.

(Chapter V. "General laws concerning the Public Health and Safety." Section C. "Laws concerning diseased animals, quarantining of, and cruelty to.")

An Act concerning the Prevention of the Spread of Contagious Diseases. Chapter 1, Part 11, Title 3, Section 6, Gen. Stat.

1699. For the purpose of preventing the spread of contagious diseases among domestic animals, said Board of Agriculture may, when in its judgment public safety demands, prohibit the introduction of any such animal into this state. When any contagious disease exists in the state, the board may quarantine all infected animals, or such as they suppose have been exposed to contagion; prohibit any animal from passing on or over any of the highways near the place of quarantine; enter upon any premises where there are animals supposed to be infected with any disease; and make all investigations and regulations necessary for the prevention, treatment, cure, and extirpation of such disease.

Section 7.

1700. The board may appoint suitable persons to inquire into and report to it, all violations of law, and of any regulations made by it; and may also appoint three commissioners on diseases of domestic animals, who shall have all power of the board in regard thereto. * * *

CHAPTER XCIV.

An Act concerning quarantining of animals.

Be it enacted by the Senate and House of Representatives in General Assembly convened.

1701. Whenever any animal, supposed to be infected or to have been exposed to contagion, shall be quarantined by the state board of agriculture, or its commissioners, pursuant to Sections 6 and 7 of Part 11, Chapter 1; Title 3 (page 1) of the general statutes, the actual pecuniary loss caused to the owner thereof by being deprived of the use of any animal or animals not infected during the period of quarantine, shall, upon the request of the owner, be ascertained by the commissioners upon evidence satisfactory to them, and the amount of such loss certified to by the commissioners shall, upon approval of the Governor, be paid by the state to said owner

Approved, April 22, 1885.

(For Section 1702 see General Statutes.)

CHAPTER CVI.

An act amending an act conferring upon the state board of agriculture power to kill diseased animals.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

1703. Section 2 of Chapter 73 (page 534) of the Public Acts of 1880 is amended to read as follows:

The commissioners shall cause all animals, before being killed under the provisions of the preceding section, to be appraised at their actual value at the time of appraisals either by agreement in writing between the commissioners and the owner or keeper of such animals, or, in case they cannot agree, by three appraisers acting under oath, one of whom shall be named by the commissioners, one by the owner or keeper of such animal and the third by the two so named, a majority of whom may make such appraisal; and in case the owner or keeper of such animals neglects or refuses, upon application of the commissioners to name an appraiser or the two appraisers named as before provided cannot agree upon a third, then any Justice of the peace of the town in which such diseased animals are, shall, upon application of the commissioners, name such appraiser; and the appraised value of such animals; if killed, shall be paid to the owner thereof and one dollar shall be paid each appraiser, and one dollar to the justice, if any be called to act by the state upon approval by the governor.

CHAPTER LX.

An act concerning the diseases of domestic animals.

Be it enacted by the Senate and House of Representatives in General Assembly convened.

1704. Chapter 73 of the Public Acts of 1880, chapter 106 of Public Acts of 1885, and chapter 94 of public Acts of 1885, relating to the prevention of contagious diseases of domestic animals, shall not apply to contagious diseases of horses.

Approved March 18, 1886.

(See sections 1552 and 3671)

(Extracts from General Statutes, Revision of 1888, to which the section numbers in the foregoing extracts refer.)

1702. The State Board of Agriculture, or in case said board shall appoint commissioners on diseases of domestic animals, under the provisions of Section 1700, then said commissioners may, when in their judgment, the public good shall require it, caused to be killed and to be disposed of afterward as in their judgment may be expedient, any animal or animals which in their judgment are infected with or have been exposed to and are liable to communicate to other animals any contagious disease.

1552. Every person who shall knowingly sell or offer for sale or

cause to be sold or offered for sale, or who shall use or expose, or allow to be used or exposed, any horse or other animal having the disease known as the glanders or farcy, shall be fined not more than fifty dollars, or imprisoned not more than thirty days, or both.

3671. Any duly appointed agent of said society may enter upon any premises where there are animals supposed to be infected with the disease known as the glanders, or farcy and examine such animals; and such agent may, when authorized by said society call a veterinary surgeon to assist in making said examination; and if, in the opinion of said agent and surgeon, said animals, or any of them, are in fact, infected with the glanders, or farcy, said agent shall thereupon notify the owner or keeper of such animals, if known, that they have been examined and are believed to be so infected, and the person so notified shall be deemed to have knowledge of the actual condition of such animal or animals.

3672. The preceding section shall not be so construed as to give to said society, or any officer or agent thereof, or to any state or local board power to condemn or to take charge of any animal examined under its provisions.

"An Act to revise the law in relation to the suppression and prevention of contagious and infectious diseases among domestic animals," approved June 27, 1885, in force July 1, 1885; as amended by an Act approved and in force April 20, 1887, in force July 1, 1887.

Section 1. Be it enacted by the people of the State of Illinois, represented in the General Assembly, That the Governor shall, with the advice and consent of the Senate, appoint three practical stock breeders, not more than two of whom shall be members of the same political party, who shall constitute a Board of Live stock Commissioners, who shall hold their office in the order in which they are named, the first one year, the second for two years, and the third for three years; and their successors in office shall be appointed for three years each. Before entering upon the duties of their office they shall take and subscribe to an oath of office for the faithful performance of their duties as such commissioners, and shall file the same with the Governor.

Section 2. It shall be the duty of said board of commissioners to cause to be investigated any and all cases or alleged cases coming to their knowledge, of contagious or infectious diseases among domestic animals, and to use all proper means to prevent the spread of such diseases, and to provide for the exportation thereof; and in the event of reasonable ground for belief that any such contagious or infectious disease has broken out in this state, it shall be the duty of the person owning or having in charge, any animal or animals infected with disease, or any other person having knowledge or reason to suspect the existence of such disease, to immediately notify said board of commissioners or some members thereof, by communication to said board of the existence

of such disease and thereupon it shall be the duty of said board, or some member thereof, or authorized agent of the board, immediately to cause proper examination thereof to be made, and if said disease shall be found to be dangerously contagious or dangerously infected malady, said board or any member thereof, or the state veterinarian or any assistant veterinarian shall order said diseased animals, and such as has been exposed to contagion, and the premises in which they are to be strictly quarantined for such time as the board, or any member thereof, or such veterinarian may deem necessary, in charge of such person as the board, or any member thereof or such veterinarian shall designate, and they shall have power to order any premises and farms where the disease exists, or has reasonably existed, as well as exposed premises and farms to be put in quarantine, so that no domestic animal which has been or is so diseased, or has been exposed to such contagious or infectious disease, be removed from the places so quarantined nor allow any healthy animal to be brought therein, except under such rule or regulation as the said board may prescribe; and said board shall prescribe such regulation as they may deem necessary to prevent such disease from being communicated in any way from the places quarantined. In all such cases of contagious and infectious diseases, the said board, or in case the number of animals shall not exceed five, any member thereof shall have power to order the slaughter of all such diseased and exposed animals. The said board shall have power to cause to be destroyed all barns, stables, premises, fixtures, furniture and personal property infected with any such contagious or infectious disease, so far as in their judgment may be necessary to prevent the spread of such disease, and where the same cannot be properly disinfected. When the board, upon the written report of the state veterinarian, or any of his assistants, determine that any animal is affected with, or has been exposed to, any dangerously contagious or infectious disease, the board, or any member thereof, may agree with the owner upon the value of such animal or property, and in case such agreement cannot be made, said board, or the member acting in behalf of the board, may appoint three disinterested citizens of the state to appraise such diseased animal or exposed animals or property. Such appraiser shall subscribe to an oath in writing to fairly value such animal in accordance with this act; which oath, together with the valuation fixed by said appraisers shall be filed with the board and be preserved by them. Upon such appraisement being made, it would become the duty of the owner to immediately destroy said animal and dispose same in accordance with the order of said board, or member thereof, and upon failure so to do, said board, or member thereof, shall cause such animal or animals or property to be destroyed and disposed of, and thereupon the said owner shall forfeit all right to receive the compensation allowed by said appraisers and provided for by this act. When the board, upon the

written opinion of the state veterinarian, determines that any barns, stables, out-buildings or premises are so infected that the same cannot be disinfected, they may quarantine such barns, stables, outbuildings or premises from use for the animals that may be infected by such disease, and such quarantine shall continue until removed by the board, and a violation of such quarantine shall be punished as is provided for violations of other quarantine by this act.

Section 3. The governor shall appoint a competent veterinary surgeon who shall be known as the state veterinarian, who, together with his assistants, shall act under the direction of said board in carrying out the provisions of this act. In the event of the inability of the state veterinarian to perform all the work which he may be directed to do by said board of commissioners, he may, by and with the advice and consent of said board, appoint such other necessary Assistant Veterinarians upon terms not exceeding that paid the state veterinarian. The state veterinarian shall receive for his service the sum of eight dollars per day for each day actually employed under the provisions of this Act, together with his necessary traveling expenses, to be certified to by the said board of commissioners.

Section 4. Whenever said board of commissioners shall report to the governor that such diseases have become epidemic in certain localities in other states, or that their condition would render such domestic animals liable to convey such diseases, he may, by proclamation, schedule such localities, and prohibit the importation of any live stock of the kind diseased into the state, except under such regulations as may be prescribed by the said board and approved by the Governor. Any corporation which shall knowingly transport, receive or convey such prohibited stock, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than $1000 nor more than $10,000 for each and every offense, and shall become liable for any and all damage or loss that may be sustained by any party or parties, by reason of such importation or transportation of such prohibited stock. Such penalty shall be recovered in any county in this state, into, or through which such stock is brought upon information filed in the circuit or county court of any such county or the superior court of Cook county. Any person who, knowing that any contagious or infectious disease exists among his domestic animals, shall conceal such fact, or knowing of the existence of such disease, shall sell the animal or animals so diseased, or any exposed animal, or knowing the same shall remove such diseased or infected animal from his premises to the premises of another, or knowing of the existence of such disease, or exposure, shall drive or lead or ship the same by any car or steamboat to another place in or out of this state, and any person or persons who shall bring any such disease, or knowingly, shall bring any such exposed animal or animals into this state, from another state; and any person or persons

who shall knowingly buy, receive, sell, convey or engage in the traffic of such diseased or exposed stock, and any person who shall violate any quarantine regulation established under the provision of this act, shall, for each, either, any and all acts above mentioned in this section be guilty of a misdemeanor, and, on conviction thereof, or of any one of said acts, shall be fined in any sum not less than $25 nor more than $200, and imprisoned in the county jail until the fine and costs are paid, and shall forfeit all right to the compensation for any animal or property destroyed under the provisions of this act. Any veterinary practitioner having information of any such contagious or infectious disease in this state, and who shall fail to promptly report such knowledge to the board of live stock commissioners shall be fined not exceeding $500, or be imprisoned in the county jail not more than one year for each offense.

Section 5. Whenever said board shall become satisfied that any dangerous contagious or infectious disease among domestic animals exists throughout any municipality or geographical district within this state, and in their judgment, it is necessary to quarantine such municipality or geographical district in order to prevent the spread of such disease into contiguous territory, they shall report the same to the Governor, who may thereupon by proclamation schedule and quarantine such district, prohibiting all domestic animals of the kind diseases within such district from being removed from one premises to another, or over any public highway or any unfenced lot or piece of ground, or from being brought into, or taken from such infected district, except upon obtaining a special permit, signed by the board of live stock commissioners, or member thereof, or agent or officer of the board duly authorized by it to issue such permits; and such proclamation shall from the time of the publication bind all persons. After the publication of the aforesaid proclamation, it shall be the duty of every person who owns or is in charge of animals of the kind diseased within the scheduled district to report to said board within one week the number and description of such animals, location, and the name and address of the owner, and during the continuance of such quarantine to report to said board all cases of sickness, deaths or births, among such animals. It shall also be the duty of any and all persons within the scheduled district receiving and purchasing cattle for slaughter, to delay the killing of such animals until a veterinary surgeon with authority from said board is present to make a post mortem examination of the carcasses. Any violation of the aforesaid quarantine regulations and duties shall be visited with like penalties, which may be recovered in like manner, as is provided for the violation of other quarantine as provided in Section 4, of this Act: *Provided*, that nothing contained in this section shall be so constructed as to prevent the movement of any animals of the kind diseased through such territory under such regulations as the board of live stock

commissioners may prescribe, and the governor approve: *And provided further*, that all cattle within the scheduled district slaughtered by order of the board shall not be taken from said district for slaughter.

Section 6. Nothing contained in this act or any section thereof, shall be interpreted so as to prevent the removal or shipment of diseased or exposed animals, under the orders of the board created by this act, from one place to another by said board or its agents, by driving along the public highway or shipment on cars or steamboats, when, in the opinion of said board, such removal is necessary for the suppression of such contagious and infectious disease.

Section 7. Whenever quarantine is established in accordance with the provisions of Section 2, of this act, valid notice of the same may be given by leaving with the owner or occupant of any premises in person, or delivering to any member of his family, or any employé over the age of ten years found on the premises so quarantined, notice thereof, written or printed, or partly written and partly printed, and, at the same time, explaining the contents thereof. Such quarantine shall be sufficiently proven in any court by the production of a true copy of such notice of quarantine with a return thereon, of the service of the same in the manner above required. Any person violating said quarantine shall be guilty of a misdemeanor and punished as is provided for in Section 41 of this Act, and, on conviction, shall be liable for all damage that may result to other persons in consequence of such violation: *Providing*, that any one feeling himself aggrieved by such quarantine may appeal to the full board of commissioners, who shall thereupon sustain, modify or annul said quarantine as they deem proper.

Section 8. All fines recovered under the provisions of this act shall be paid into the county treasury of the county in which the suit is tried, by the person collecting the same, in the manner now provided by law, to be used for county purposes; and it shall be the duty of state's attorneys in their respective counties, to prosecute for all violations of this act.

Section. 9. All claims against the state arising from the slaughter of animals, as herein provided for shall be made to said board of commissioners under such rules and regulations as they may prescribe, and it shall be the duty of said board of commissioners to determine the amount which shall be paid in each case on account of animals so slaughtered, which, in cases of animals of the bovian species, shall be based on a fair cash market value thereon for beef, or for use for dairy purposes, not to exceed $75 per head; and, in cases of animals of the equine species, on their fair cash market value, not to exceed $100 per head, and report the same to the governor; and the governor shall endorse thereon his order to the state officer, he shall thereupon issue his warrant on the state treasurer for the same.

Section 10. Said board of commissioners, or any member thereof,

and the state veterinarian and his assistants, in the performance of their duties under this act shall have power to call on sheriffs and their deputies, constables and peace officers, mayors of cities, city and town marshalls and policemen to assist them in carrying out its provision, and it is hereby made the duty of all such officers to assist in carrying out the provisions of this act when ordered so to do; and said commissioners and the state veterinarian and his assistants, that have, while engaged in carrying out the provisions of this act, the same powers and protection that other peace officers have and any such officer who fails or refuses to enforce the lawful orders and quarantine of said board, or any member thereof, or any veterinarian or anything under them, in the proper execution of the powers conferred by this act, shall be deemed guilty of a misdemeanor and punished as provided in Section 4, of this Act.

Section 11. The said board shall co-operate with any commissioner, or other officer, appointed by the United States for the suppression of contagious diseases among domestic animals, so far as the provisions of this act and the appropriations made in accordance therewith will allow, in suppressing and preventing the spread of contagious and infectious diseases among domestic animals in this state.

Section 12. It shall be the duty of said board of commissioners to keep a record of all their acts and proceedings, and report the same to the governor annually, or oftener if required, for publication. The annual reports shall include an itemized statement of all sums expended by them under this act, including a statement of all damage recommended by them to be paid for all animals slaughtered, and the amounts paid therefor.

Section 13. The members of the said board shall each receive the sum of $5 per day for each day necessarily employed in the discharge of their duties, their necessary travelling expenses, and other incidental expenses necessarily incurred in the performance of their duties under this act, to be paid on certified and itemized vouchers to be approved by the governor.

Section 14. All acts and parts of acts inconsistent herewith are hereby repealed.

Clause 35 of the General Appropriation Act of 1887.

Thirty-fifth. For paying damages for animals diseased or exposed to contagion, slaughtered, and for property necessarily destroyed, and for expenses of disinfection of premises, when such disinfection is practicable under the provisions of any law of this state for the suppression and prevention of the spread of contagious and infectious diseases among domestic animals, the sum of seventy-five thousand ($75,000) dollars per annum, or so much thereof as may be necessary; also any sums of money that may be received by the board of live stock commissioners as the net proceeds of the sales of the healthy carcasses of ani-

mals slaughtered under the provisions of the law and paid by them into the state treasury, to be paid only in the manner and on the conditions provided in said law: *Provided*, that the amount paid for animals slaughtered shall not exceed their actual cash value, and in no case shall the sum paid for any one animal exceed seventy-five ($75) dollars for cattle, and one hundred ($100) dollars for animals of the equine species, also, the board of live stock commissioners the sum of fifteen thousand ($15,000) dollars per annum, or so much thereof as may be necessary for the payment of the necessary expenses incurred in the discharge of their duties as prescribed by law, including the per diem and expenses of the state and assistant state veterinarians, the salary of a secretary, and the sum of five ($5) dollars per day, to each member of the board appointed and acting under the law, approved June 27th, 1885, in force July 1, 1885, for the actual number of days heretofore employed by them in such duties, and for which they have not heretofore received compensation.

Rules.

1. When a supposed case of contagious pleuro-pneumonia or lung plague in cattle is reported to the state or an assistant state veterinarian, he shall at once notify the secretary of this board of such report, and immediately thereafter make a thorough examination of the diseased animal or animals, and, if he has good reason to believe that the case under consideration is contagious pleuro-pneumonia or lung plague, he shall at once quarantine the animal or animals diseased and promptly report his action to the secretary of the board.

2. When a supposed case of glanders in horses, mules or asses is reported to the state veterinarian, or an assistant state veterinarian, he shall at once notify the secretary of this board, and shall also mail to the owner or informant a list of questions prescribed by this board with a request to answer the same. Upon receipt of answer to these questions if he believes the animals are affected with glanders, he shall at once visit the premises where such animals are, and thoroughly examine same, and, if upon examination he is satisfied that the disease is glanders, he shall quarantine the animal or animals and premises, and also quarantine all animals or premises that have been exposed to such disease and promptly notify the secretary of this Board of his action. Should the answers to the questions above referred to convince him that the disease is not glanders, he shall at once report that conclusion to the secretary, accompanying the same with all the correspondence relative to the case and also notify the owner or informant of his opinion.

3. The state veterinarian and assistant state veterinarians will inspect the horses of all circus troupes (not already inspected,) bands of gypsies, and herds of horses brought into this state by traders, and if the same are found to be infected with glanders, quarantine them and all

animals exposed, and notify the sheriff and other proper officers of the county, and immediately report his action to the secretary of this board.

4. All quarantines established by the state or any of the assistant state veterinarians shall continue in force until removed by order of the board. Parties whose animals are quarantined under the provisions of law may have the same release from quarantine by making satisfactory proof to the board that the cause for which such quarantine was originally declared no longer exists; provided that no quarantine as to animals shall be removed in less time than ninety days after the last exposure.

5. The state veterinarian and the assistant state veterinarians in reporting under rules numbers 1, 2 and 3, shall give the name and post office address of the owner of animals inspected, location of such animals, date of inspection, complete description of animals diseased and of animals exposed, a description of the exposure to which they have been subjected, the condition of the diseased animals, the value of such animals in their condition at the time of inspection, their value were they free from glanders, the name and address of the nearest constable, and the time employed in such investigation. The report must be accompanied by an exact duplicate of the quarantine notice served with return made thereon of the manner of service, and all correspondence with all persons relative to the case. Said report must be addressed to the "Board of Live Stock Commissioners of the State of Illinois," and directed to the secretary at Springfield, Illinois.

6. Whenever it shall come to the knowledge of an assistant state veterinarian that animals have been brought into his locality from a state or county known or believed to be infected, against which the governor of this state has proclaimed, he shall immediately notify the secretary of this board of the facts so far as he knows them, covering the following points, viz: locality from whence such animals came, name and post office address of the owner or person in charge; if shipped by railroad or boat, giving name or names of same, time of arrival; number, age, sex and breed of animals so far as it is practicable to ascertain.

Indiana.

(From laws, rules and regulations relating to Public Health of Indiana. Issued by the State Board of Health.)

(*Section* 2202.) Whoever knowingly permits any horse, mare or gelding, affected with glanders, to be taken from his or her premises, or to run at large, shall be fined not more than one hundred dollars, nor less than five dollars.

(*Section* 2103.) Any person being the owner of sheep or having the same in charge, who shall turn out, or suffer any sheep having any contagious disease, knowing the same to be diseased to run at large upon any common, highway or unenclosed ground, or who shall sell a[illegible]

... to be diseased, without fully disclosing
... deemed guilty of a misdemeanor, and
... than two, nor more than twenty-five
... to be recovered as other penalties for

... where any hog, shoat, or other domes-
... commonly called "Hog Cholera," or
... the duty of the owner or owners of such
... animal or the person or persons having
... having knowledge of the fact, or upon
... the carcass, of said hog, shoat or other
... unnecessary delay to be burned or safely or

... owner or owners of such hog, shoat or other
... with disease, or any person or persons hav-
... having knowledge of the fact, or upon
... fail, neglect or refuse to comply with the
... he, she or they, so offending, shall
... and upon conviction thereof before any tri-
... the offence, shall be fined in any sum not
... than fifty dollars.
... unlawful for any person to bring into the
... infected with the disease commonly known
... Fever," or any cattle liable to impart said

Iowa.

... of Iowa, compiled by the State Board of Health.

Diseased Animals.

CHAPTER 189, LAWS OF 1884.

... a State Veterinary Surgeon and defining his duties.

... by the General Assembly of the State of
... shall appoint a state veterinary surgeon, who
... for a term of three years unless sooner removed by
... shall be a graduate of some regular and established
... college, and shall be skilled in veterinary science; he shall
... the State Board of Health, which membership shall
... now provided by law. When actually engaged
... his official duties he shall receive from the State
... compensation, the sum of five dollars per day and his
... which shall be presented under oath and covered by
... before receiving the same.
... shall have general supervision of all contagious and
... among domestic animals within or that may be in

transit through the state, and he is empowered to establish quarantine against animals thus diseased, or that have been exposed to others thus diseased, whether within or without the state, and he may with the concurrence of the State Board of Health, make rules and regulations such as he may deem necessary for the prevention against the spread, and for the suppression of such disease or diseases, which rules and regulations, after the concurrence of the governor and executive council, shall be publisned and enforced, and in doing said things he shall have power to call on one or more peace officers, whose duty it shall be to give him all assistance in their power.

Section 3. Any person who wilfully hinders, obstructs or resists said veterinary surgeon or his assistants, or any peace officer acting under him or them engaged in the duties of exercising the powers herein conferred, shall be guilty of a misdemeanor and punished accordingly.

Section 4. Said veterinary surgeon shall on or before the 30th of June of each year, make a full and detailed report of all and singular his doings since his last report to the governor, including his compensation and expenses, and the report shall not exceed one hundred and fifty pages of printed matter.

Section 5. Whenever the majority of any board of supervisor, city council, trustees of an incorporated town, or township trustee, whether in session or not, shall in writing notify the governor of the prevalence of, or probable danger from, any of said diseases, he shall notify the state veterinary surgeon who shall at once repair to the place designated in said notice and take such action as the exigencies may demand, and the governor may in case of emergency appoint a substitute or assistant legal powers and compensate them.

Section 6. Whenever in the opinion of the state veterinary surgeon the public safety demands the destruction of any stock under the provisions of this act, he shall, unless the owner or owners consent to such destruction, notify the governor who shall appoint two competent veterinary surgeons as advisors, and no stock shall be destroyed except upon the written order of the state veterinary surgeon, countersigned by them and approved by the governor, and the owners of all stock destroyed under the provisions of this act, except as hereinafter provided, shall be entitled to receive a reasonable compensation therefor; but not more than its actual value in its condition when condemned, which shall be ascertained and fixed by the state veterinary surgeon and the nearest justice of the peace, who if unable to agree shall jointly select another justice of the peace as umpire; and their judgment shall be final when the value of the stock does not exceed one hundred dollars, but in all other cases either party shall have the right to appeal to the circuit court; but such appeal shall not be the destruction of the diseased animals. The state veterinary surgeon shall, as soon thereafter, as may be, file his written report thereof with the governor, who shall

if found correct, endorse his findings thereon, whereupon the auditor of the state shall issue his warrant therefor upon the treasurer of state who shall pay the same out of any monies at his disposal under the provisions of this act: *Provided*, that no compensation shall be allowed for any stock destroyed while in transit through or accross the state, and that the word stock, as herein used, shall be held to include only meat cattle and horses.

Section 7. The governor of the state, with the state veterinary surgeon may co-operate with the government of the United States for the objects of this act, and the governor is hereby authorized to receive and receipt for any monies receivable by this State under the provision of any act of congress which may at any time be in force upon this subject and pay the same into the state treasury to be used according to the act of congress and the provisions of this act as nearly as may be.

Section 8. It is hereby appropriated out of any monies not otherwise appropriated the sum of ten thousand dollars for use in 1884 and 1885, and three thousand dollars annually thereafter, or so much thereof as may be necessary for the uses and purposes herein set forth.

Section 9. Any persons, except the veterinary surgeon, called upon under the provisions of this act shall be allowed and receive two dollars per day while actually employed.

Approved April 14, 1884.

CHAPTER 156, LAWS OF 1886.

An act to amend chapter 11, title 24 of the Code, relating to Contagious diseases in domestic animals.

Section 1. Be it enacted by the General Assembly of the State of Iowa: That sections 4058, and 4059 in chapter 11, title 24, out of the Code be hereby repealed, and sections two and three of this act be substituted therefor, and be known hereafter as sections 4058 and 4059 of the Code.

Section 2. Be it enacted: Section 4058. Any person or persons driving any cattle into this state or any agent, servant or employé of any railroad, or other corporation who shall carry, transport or ship any cattle into this state, or any railroad company, or other corporation or person, who shall carry, ship or deliver any cattle into this state, or the owners, controllers, lessees, or agent or employés of any stock yards, receiving into such stock yards, or in any other enclosures for the detention of cattle in transit, or shipment, or re-shipment or sale, any cattle brought to shipped in any manner into this state, which at the time they were either driven, brought, shipped or transported into this state where in such condition as to infect with or to communciate to other cattle, pleuro-pneumonia, splenitic or texas fever, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by fine of

not less than three hundred dollars and not more than one thousand dollars, or by both fine and imprisonment in the county jail not exceeding six months in the discretion of the court.

Section 3. Be it enacted: Section 4059. Any person who shall be injured or damaged by any of the acts of the persons named in section 4058 and which are prohibited by such section in addition to the remedy therein provided, may bring an action of law against such persons, agents, employés or corporations mentioned therein, and recover the actual damages sustained by the person or persons so injured, and neither said criminal proceeding nor said civil action, in any stage of the same be a bar to a conviction or to a recovery in the other.

Approved April 10, 1886.

Section 4055. If the owner of sheep, or any person having the same in charge, knowingly import or drive into this State, sheep having any contagious disease, or turn out, or suffer any sheep having any contagious disease, knowing the same to be so diseased, to run at large upon any common highway, or unenclosed lands, or sell or dispose of any sheep knowing the same to be so diseased, he shall be deemed guilty of a misdemeanor, and punished by a fine in any sum not less than fifty dollars nor more than one hundred dollars. Code of 1873.

Section 4356. If any person knowingly import or bring within this state, any horse, mule or ass, effected by the disease known as nasal gleet, glanders or button-farcy, or suffer the same to run at large upon any common highway or unenclosed land, or use or tie the same in any public place; or off his own-premises, or sell, trade, or offer for sale or trade, any such horse, mule or ass knowing the same to be so diseased, he shall be deemed guilty of a misdemaanor and shall on conviction, be punished by a fine of not less than fifty dollars nor more than five hundred dollars, aud in default of payment shall be imprisoned for any period not exceeding twelve months, or by both fine and imprisonment, at the discretion of the Court. Code of 1873.

Section 4057. If any horse, mule or ass, reasonably supposed to be diseased with nasal gleet, glanders or button farcy, be found running at large without any known owner, it shall be lawful for the finder thereof to take such horse, ass or mule so found before some justice of the peace, who shall forthwith cause the same to be examined by some veterinary surgeon, or other persons skilled in such diseases, and if, on examination, it is ascertained to be so diseased, it is lawful for such justice of the peace to order such diseased animal to be immediately destroyed and buried; and the necessary expense accuring under the provisions of this act shall be defrayed out of the county treasury. Code of 1873.

As to whether or not animals so affected with a contagious disease, may be summarily destroyed the general rule seems to be that so long as the owner restrains the animal upon his premises no person has the

right to kill him, but if they are suffered to go at large or if they escape from their owners custody, the owner of the premises upon which they escape may kill them if necessary for the protection of his own animals. (Wood on nuisances, Section 837.) In the case of a horse or other animal affected with glanders, it is recognized by the courts as an incurable disease (Hanover's Law of Horses, p. 76) and one which may communicate all its loathsomeness and fatality to human beings. A board of health would unquestionably be sustained by the courts in destroying them whenever found, if they deemed it necessary to protect the public health, after giving notice to the owner if he can be found.

Section 1484. The sheriff, constable, police officer, officer of any society for the prevention of cruelty to animals, or any magistrate, shall destroy any horse or other animal having the disease known as glanders or any disabled creature unfit for other use. Code of 1873.

From the rules and regulations for the prevention and restriction of contagious diseases among domestic animals.

Rule 1. All meat cattle that have been reared, or kept south of the parallel forming the north boundary of Indian Territory, or 37 north latitude and that have not subsequently been kept continuously at least one winter north of said parallel, and which may be brought within the limits of this state the 1st day of April and the 1st day of November following, except for transportation through the State on railways or boats, shall be subject to quarantine; and all land on which such cattle may have been kept or fed within this State, shall in like manner be subject to quarantine.

Rule 2. All cattle, as defined in Rule 1, while in transportation through this State, which may be removed from any car or boat, within this State for the purpose of feeding, watering, reshipment or other cause whatsoever, shall be confined in yards, stables or enclosures, separate or apart form all other anmials, and no other cattle shall be permitted to come within such yards, stables or enclosures, or in contact with such quarantined and enclosed cattle.

Between the first day of April and the first day of November following, no cattle whatsoever, except such as are defined in Rule 1, shall be placed within any stable, yard, or other enclosure where cattle have been quarantined under Rule 1, unless such yards, stables, and enclosures have been previously thoroughly cleansed and disinfected.

Rule 4. All cattle brought within this state from any county or parish within the United States where pleuro-pneumonia is known to exist, shall be subject to quarantine for a period of not less than sixty days.

Rule 5. The carcasses of all animals that have died from Anthrax, shall, without removal of the hide, or any part of said carccas, be burned, or buried not less than four feet deep in the ground, and thoroughly covered with kerosene before covering the earth.

Reasons for Rule 5. To prevent the possibility of a recurrence of this disease from germs existing in the grave, which if not destroyed by some powerful agent will retain their vitality for a number of years, so as to impart the disease.

As anthrax is communicable by inoculation to human beings, great precaution should be used in handling animals affected with this disease.

Rule 6. No person owning or having the care or custody of any animal affected with glanders or farcy, or which there is reason to believe is affected with said diseases, shall lead, drive, or permit such animal to go on or over any public ground, unenclosed lands, street, road, public highway, lane, or alley; or permitted to drink at any public water trough, pail or spring; nor keep such diseased animal in any inclosure in or from which such diseased animals may come in contact with, or close proximity, to any animal not affected with such disease.

Rule 7. Whenever notice is given to the trustees of a township, or the health officer of a local board of health, of animals suspected of being affected with glanders or farcy, said trustees, or health officers shall immediately require such suspected anmials to be isolated and kept separate and apart from all other animals until released by order of the state veterinary surgeon or some person acting by his authority.

Rule 8. An animal must be considered as "suspected" when it has stood in the stable or been in contact with an animal known to have glanders; or if placed in a stable, yard, or other enclosure where a glandered animal has been kept.

Rule 9. Whenever any animal affected with glanders or farcy, shall die, or shall be killed, the body of such animal shall be immediately burned, or buried not less than four feet deep, without removing the hide and carcass.

Rule 10. No animal diseased with glanders or farcy shall be deemed to have any property value whatever, and no appraisal thereof will be made.

Reasons for Rule 10. Glanders is an incurable disease, and there is no warrant for expending public money in appraising property manifestly worthless, and which can be compensated for only at "its actual value in its condition when condemned." Also to prevent the introduction of diseased animals into the state and the inoculation of worthless ones for speculative purposes.

Rule 11. Whenever the owner, or person having in charge any animal declared by the state veterinary surgeon or other authorized person to have the glanders, shall neglect or refuse to destroy said animal, the premises whereon such animal is kept shall be quarantined until such animal is destroyed and the premises thoroughly disinfected.

Rule 12. The term "quarantine" shall be construed to mean the perfect isolation of all diseased or suspected animals in contact with

healthy animals: as well as the exclusion of such healthy animals from the yards, stables, enclosures or grounds wherever said suspected or diseased animals are or have been kept.—*Extracts from the Laws of the State of Kansas.*

CHAPTER 2—*Laws special session.*

An act for the protection of Domestic Animals.

Section 1. Be it enacted by the legislature of the State of Kansas: Three commissioners to be appointed by the governor, by and with the advice and consent of the senate, shall constitute the Live Stock sanitary commission of the State of Kansas, before entering upon the duties of his office each commissioner shall take and subscribe the oath of office, and file the same with the secretary of the state; and each commissioner, before entering upon the performance of his duties shall execute a bond to be approved by the executive council, in the sum of two thousand dollars, conditioned that he will faithfully perform the duties of his office, and file the same with the Secretary of State. The term of office of said commissioners shall be for the period of one, two and three years, respectively, from the first day of April next succeeding their appointment, and the governor shall have power to fill any vacancy in said commission. Said commissioners shall elect one of their number chairman, and the state veterinarian shall be *ex-officio* secretary of the commission. The secretary shall keep a full record of the proceedings of the commission and make such report to the governor as may from time to time be required, who may transmit the same to the secretary of the state board of agriculture for public uses.

Section 2. It shall be the duty of the commission provided for in the first section of this act, to protect the health of the domestic animals of the state from all contagious or infectious diseases of a malignant character, and for this purpose hereby authorize and empower to establish, maintain and enforce such quarantine, sanitary and other regulations as it may deem necessary. It shall be the duty of any member of said commission upon receipt by him of reliable information of the existence, among domestic animals of the state, of any malignant disease, to at once notify the state veterinarian, who shall go at once to the place where any such disease is alleged to exist, and make a careful examination of the animals believed to be affected, with any such disease, and ascertain if possible, what, if any disease exists among the live stock reported to be affected, and whether the same is contagious or infectious, or not; and if said disease is found to be of malignant, contagious or infectious character, he shall direct the temporary quarantine and sanitary regulations necessary to prevent the spread of any such disease, and report his findings and actions to the commissioner.

Section 3. Upon the receipt by any member of this commission of the report of the state veterinarian, provided for in section 2 of this act, if

said member shall be of the opinion that the exigencies of the case require, he shall immediately convene the commission at such place as he may designate, and if, upon consideration of the report of the veterinarian, the commission shall be satisfied that any contagious or infectious disease exists of a malignant character; which seriously threatens the health of domestic animals, they shall proceed at once to the infected district, ascertain and determine the premises or grounds infected and establish quarantine, sanitary and police regulations necessary to circumscribe and exterminate such disease; also to list and describe the domestic animals affected with such disease and those that have been exposed thereto, and included within the infected district or premises so defined and quarantined, with such reasonable certainty as would lead to their identification; and for that purpose the said commission may, in its discretion cause the live stock so included within the quarantined lines established, to be marked or branded in such manner as the commissioners may designate and no domestic animal liable to become infected with the disease, or capable of communicating the same, shall be permitted to enter or leave the district, premises, or grounds so quarantined, except by authority of the commission. The said commission shall also from time to time give and enforce such directions, and prescribe such rules and regulations, as to separating, mode of handing, treating, feeding and caring for such diseased and exposed animals, as it shall deem necessary to prevent the two classes of animals from coming in contact with each other, and perfectly isolate them from all other domestic animals which have not been exposed thereto, and which are susceptible of becoming infected with the disease. And the said commission, or any of the members thereof, and said veterinarian, are hereby authorized and empowered to enter upon any grounds or premises to carry out the provisions of this act.

Section 4. When in the opinion of the commission it shall be necessary, to prevent the further spread of any contagious or infectious disease among the live stock of the state, to destroy animals affected with, or which have been exposed to, any such disease, it shall determine what animals shall be killed, and appraise the same as hereinafter provided, and cause the same to be killed, and the carcasses disposed of as in its judgment will best protect the health of the domestic animals of the locality.

Section 5. Whenever, as in the fourth section of this act provided, the commision shall direct the killing of any domestic animal or animals, it shall be the duty of the commissioners, to appraise the animal or animals to be killed, and shall make an inventory of the animal or animals condemned, and in fixing the value thereof, the commissioners shall be governed by the value of said animal or animals at the date of appraisment: *Provided*, That no animal or animals shall be appraised except those affected with contagious pleuro-pneumonia of cattle, or foot-and-mouth disease, or such as have been exposed thereto.

Section 6. When the commission shall have determined the quarantine and other regulations necessary to prevent the spread among domestic animals of any malignant, contagious or infectious disease found to exist among the live stock of the state, and given its order as herein-before provided, prescribing quarantine and other regulations, it shall notify the governor thereof, who shall issue his proclamation proclaiming the boundary of such quarantine, and the orders, rules and regulations prescribed by the commission, which proclamation may be published by written or printed handbills posted within the boundaries or on the lines of the district, premises, places or grounds quarantined, or by being published in the official state paper: *Provided*, That if the commission decide that it is not necessary, by reason of the limited extent of the district in which such disease exists, that a proclamation should be issued, then none shall be issued; but such commissions shall give such notice as may to it seem best to make the quarantine established by it effective.

Section 7. The commission provided for in this act shall have power to employ at the expense of the state such persons, and purchase such supplies and material, as may be necessary to carry into full effect all orders by it given, as herein before provided: *Provided*, That no labor shall be employed, nor material or supplies purchased by the commission, except such additional labor, material and supplies as may be necessary to carry into effect the quarantine and other regulations prescribed by the commission.

Section 8. It shall be the duty of the railway corporations doing business in this state to cleanse and disinfect the cars used by them in transporting stock in this state, at such times and places as the commission may designate, whenever in the opinion of the commission any such order may be necessary to prevent the spread of infectious or contagious diseases. Any such corporation violating any of the provisions of this section shall be liable to a penalty of five hundred dollars for each offense, to be recovered in a civil action to be prosecuted under the direction of the attorney general, in the name of the state of Kansas.

Section 9. When any animal or animals are killed under the provisions of this act by order of the commission, the owner thereof shall be paid therefore the appraised value as fixed by the appraisement herein before provided for: *Provided*, The right of indemnity on account of animals killed by order of the commission under the provisions of this act, shall not extend to the owner of animals which have been brought into the state in a diseased condition, or from a state, county, territory or district in which the disease with which the animal is infected, or to which it has been exposed, exists. Nor shall any animal be paid for by the state which may be brought into the state in violation of any law or quarantine regulations thereof; or the owner of which shall have violated any of the provisions of this act, or disregarded any rule, regula-

tion or order of the live stock sanitary commission; or any member thereof. Nor shall any animal be paid for by the state which came into the possession of the claimant with the claimant's knowledge that such animal was diseased or was suspected of being diseased, or of having been exposed to any contagious or infectious disease. Nor shall any animal belonging to the United States be paid for by the state.

Section 10. It shall be the duty of any owner or person in charge of any domestic animal or animals who discovers, suspects or has reason to believe that any of his domestic animals, or domestic animals in his charge, are affected with any contagious or infectious disease, to immediately report such fact, belief or suspicion to the commission, or any member thereof, and to the sheriff and county clerk of the county in which such domestic animal is found; and it shall be the duty of any person who discovers the existence of any contagious or infectious disease among the domestic animals of another, to report the same at once to the sheriff and county clerk of the county in which such domestic animal is found.

Section 11. The sheriff to whom the existence of any infectious or contagious disease of domestic animals is reported, shall forthwith proceed to the place where such domestic animal is, and examine the same, and forthwith report the result of such an examination to the commission, or any member thereof, and shall prescribe such temporary quarantine regulations as will prevent the spread of the contagion or infection until the live stock sanitary commission can provide and order suitable quarantine rules and regulations.

Section 12. Any person who shall knowingly bring into this state any domestic animal which is affected with any contagious or infectious disease, or any animal which has been exposed to any contagious or infectious disease: shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in any sum not less than $500 nor more than $5000.

Section 13. Any person who owns, or is in possession of, live stock which is, or which is suspected or reported to be, affected with any infectious or contagious disease, who shall refuse to allow the state veterinarian, or other authorized officer or officers, to examine such stock or shall hinder or obstruct the state veterinarian, or other authorized officer or officers, in any examination of, or in an attempt to examine, such stock, shall be guilty of a misdemeanor; and upon conviction thereof shall be fined in any sum not less than $100 nor more than $500.

Section 13. Any person who shall have in his possession any domestic animal affected with any contagious or infectious disease, knowing such animal to be so affected, or after having received notice that such animal is so affected, who shall permit such animal to run at large, or who shall keep such animal where other domestic animals not affected by or previously exposed to such disease may be exposed to its con-

tagion or infection, or who shall sell, ship, drive, trade or give away such diseased animal or animals which have been exposed to such infection or contagion, or who shall move or drive any domestic animal in violation of any direction, rule, regulation or order establishing and regulating quarantine, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than $100 nor more than $500 for each of such diseased or exposed domestic animals which he shall permit to run at large, or keep, or sell, ship, drive, trade or give away in violation of the provisions of this act: *Provided*, That any owner of any domestic animal which has been affected with or exposed to any contagious or infectious disease may dispose of the same, after having obtained from the state veterinarian a bill of health for such animal.

Section 15. When any live stock shall be appraised and killed by order of the commission, it shall issue to the owner of the live stock so killed a certificate, showing the number and kind of animals killed, and the amount to which the holder is entitled, and report the same to the auditor of the state. And upon presentation of such certificate to the auditor he shall draw his warrant on the treasurer for the amount therein stated, payable out of any money appropriated for the payment of such claim.

Section 16. The provisions of this act shall not be constructed to include any other than contagious or infectious diseases, nor shall it be construed as to interfere in any manner with the provisions of chapter 144, Session Laws of 1883.

Section 17. The members of the Commission, appointed by the governor as hereinbefore provided shall receive five dollars per day for the time by them necessarily employed in the discharge of the duties required by this act. And each member of the commission hereinbefore provided for shall receive the actual necessary traveling expenses by him incurred and paid in the discharge of the duties required of him by the provisions of this act, which said per diem and expenses shall be drawn from the treasury on the warrant of the auditor, to be issued on the filing in his office of an itemized account thereof properly verified.

Section 18. Whenever the governor of the state shall have good reason to believe that any dangerous contagious or infectious disease has become epidemic in certain localities in other states, territories, or countries, or that there are conditions which render such domestic animals from such infected district liable to convey such disease, he shall, by proclamation, prohibit the importation of any live stock of the kind diseased into the state, unless accompanied by a certificate of health, given by a duly authorized veterinarian inspector and all such animals arriving in this state shall be examined without delay by the state veterinary surgeon, and, it being necessary placed in close quarantine until

all danger of infection is passed, when they shall be released by the order of the veterinary surgeon or the live stock commission.

Section 19. That the owners of any stock yards doing business in this state, when requested by the live stock sanitary commission, shall appoint and keep constantly in their employ at their expense, a competent inspector of live stock, whose duty it shall be to daily inspect with care all animals brought into the stock yards in whose employ any such inspector may be; and upon the discovery, by such inspector, in such yards, of any animal affected with any malignant, contagious or infectious disease, he shall direct the manner in which any such diseased animal shall be disposed of so as to prevent the spread of any such contagious or infectious disease, and for this purpose may cause any such diseased animals to be killed and the carcasses to be disposed of at the expense of the owner thereof, in such manner as will prevent the spread of any such disease; but in no event shall any such diseased stock be permitted to be driven or shipped out of any such stock yards, except to some rendering establishment, or other suitable place of killing and disposing of such diseased animal as hereinbefore provided for, and then under such regulations and restrictions as may be necessary to prevent the spread of the disease on account of which any such animals have been condemned: *Provided*, That the owner of any animal or animals ordered to be destroyed by the inspector shall have the right to appeal from the decision of such inspector to the state veterinarian of the state live stock sanitary commission; and during the pendency of such appeal the condemned animals shall be kept in strict quarantine at the expense of the owner thereof, unless the state veterinarian shall decide such stock is not so diseased—then said expenses shall be paid by the owners of such stock yards: *And provided further* that no compensation shall be made by the state to owners of diseased live stock found in public stock yards and destroyed as herein provided. The inspector of live stock, in any stock yards in this state, shall, on demand of the owner of any live stock passing through any such stock yard, furnish the said owner a bill of health for any live stock by him inspected as hereinbefore required and found to be healthy.

Section 20. The Commissioners shall have the power to call upon any sheriff, under sheriff, deputy sheriff or constable to execute their orders, and such officers shall obey the orders of said commissioners, and the officers performing such duties shall receive compensation therefor as is prescribed by law for like services, to be paid as other expenses of said commission as hereinbefore provided; and any officer may arrest on view, and take before any magistrate of the county any person found violating the provisions of this act, and such officer shall immediately notify the county attorney and he shall prosecute the person so offending according to law.

Section 21. Except as otherwise provided in this act, any person who

shall violate disregard or evade, or attempt to violate, disregard or evade any of the provisions of this act, or who shall violate, disregard, or evade or attempt to violate disregard or evade any of the rules, regulations, orders or directions of the live stock sanitary commission establishing and governing quarantine, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than $100 or more than $5000.

Section 22. The provisions of this act shall not apply to sheep and hogs, except when affected or exposed to foot-and-mouth disease, or to cattle when affected by the disease known as Spanish or Texas fever.

Section 23. For the purposes of this act each member of the live stock sanitary commission is hereby authorized and empowered to administer oaths and affirmations.

Section 24. This Act shall take effect and be in force from and after its publication once in the official state paper.

Approved March 24, 1884.

CHAPTER 191, LAWS 1885.

An act for the protection of cattle against Texas splenic or Spanish fever, and repealing chapter three of the special laws of eighteen hundred and eighty-four.

Section 1. Be it enacted by the Legislature of the State of Kansas: No person or persons shall, between the first day of March and the first day of December of any year, drive or cause to be driven into or through any county or parts thereof in this state, or turn upon or cause to be turned or kept upon any highway, range, common or uninclosed pasture within this state, any cattle capable of communicating or liable to impart what is known as Texas, splenic or Spanish fever. Any person violating any provision of this Act shall upon conviction thereof be adjudged guilty of a misdemeanor, and shall for each offense be fined not less than $100 and not more than $2000, or be imprisoned in the county jail not less than thirty days and not more than one year, or by both such fine and imprisonment.

Section 2. It shall be the duty of any sheriff, under sheriff, deputy sheriff or constable within this state, upon a complaint made to him, by any citizen of the state or otherwise having notice or knowledge that there are within the county where such officer resides, cattle believed to be capable of communicating or liable to impart the disease known as Texas, splenic or Spanish fever, to forthwith take charge of and restrain such cattle under such temporary quarantine regulations as will prevent the communication of such disease, and make immediate report thereof to the live stock sanitary commission; and such officers shall keep said cattle in custody as aforesaid until released by order of said live stock sanitary commission, and no officer who shall take or detain any cattle under the provisions of this act shall be liable to the owner or owners of such cattle for any damages by reason of such taking or

detention or by reason of the performances of any other duty enjoined upon this act.

Section 3. Whenever the live stock sanitary commission shall determine that certain cattle within the state are capable of communicating or are liable to impart Texas, splenic or Spanish fever, they shall issue their order to the sheriff or any constable of the county in which said cattle are found, commanding him to take and keep such cattle in his custody, subject to such quarantine regulations as they may prescribe, until the first day of December next ensuing, on which date they shall direct such officer to deliver said cattle to their owner or owners, or his or their agent: *Provided, however*, That before any cattle so held shall be delivered as aforesaid, there shall be paid to said live stock sanitary commission all the costs and expenses of taking, detaining and holding said cattle; and in case such costs and expenses are not so paid within ten days after the said first of December, the said officer shall advertise in the same manner as is by law provided in cases of sales of personal property, that he will sell such cattle, or such portions thereof as may be necessary to pay such costs and expenses, beside the expense of such sale; and at the time and place so advertised he shall proceed to sell as many of said cattle as shall be necessary to pay off such costs and expenses and the expenses of sale, and shall forthwith pay over the live stock sanitary commission any amount so received in excess of the legal fees and expenses of such officer. Any officer performing any of the duties enjoined in this section or in the next preceding section of this act shall receive the same compensation therefor as is prescribed by law for similar services, to be paid as other expenses of said live stock sanitary commission are paid as provided by law.

Section 4. Any person or persons violating any of the provisions of this act shall be liable to any party injured through such violation, for any damages that may thereby arise from the communication of Texas, splenic or Spanish fever, to be recovered in a civil action; and the parties so injured shall have a lien for such damages on the cattle so communicating the disease.

Section 5. In the trial of any person charged with the violation of any of the provisions of this act, and in the trial of any civil action brought to recover damages while in communication of Texas, splenic or Spanish fever, proof that the cattle which such person is charged with driving or keeping in violation of the law, or which are claimed to have communicated the said disease, where brought into this state between the first day of March and the first day of December of the year in which the offence is committed or such cause of action arose, from south of the thirty-seventh parallels of latitude, shall be taken as prima facia evidence that such cattle were capable of communicating and liable to impart Texas, splenic or Spanish fever; within the meaning of this act,

and that the owner or owners, or person in charge of such cattle, had full knowledge and notice thereof at the commission of the alleged offense: *Provided, however*, That if the owner or owners, or person in charge of such cattle, shall show by such certificate or certificates as shall hereafter be designated by the live stock sanitary commission of this state, that the said cattle had been kept since the first day of December of the previous year, west of the east line of the Indian Territory and north of the thirty-sixth parallel of north latitude, or west of the twenty-first meridian of longitude west from Washington, and north of the thirty-fourth parallel of north latitude, the provisions of this section shall not apply thereto: *Provided, also*, That the provision of this section shall not apply to cattle which are owned or kept in this state and which may drift across the south line of the state when the said cattle are gathered in a round-up and return under the direction of any live stock association in this state.

Section 6. Whenever two or more persons shall in violation of this act, at the same time or at different times during the same year, drive or cause to be driven upon the same highway, range, common or pasture, within this state, any cattle capable of communicating, or liable to impart Texas, splenic or Spanish fever, they shall be jointly and severally liable for all damages which may arise from the communication of such disease at any time thereafter during the same year to any native, domestic or acclimated cattle that shall have been upon the same highway, range, common or pasture so previously traveled over by such first mentioned cattle.

Section 7. Justices of the peace within their respective counties shall have criminal jurisdiction in all cases arising under the provisions of this act.

Section 8. It shall be the duty of the prosecuting attorney of the proper county to prosecute, on behalf of the state, all criminal cases arising under this act.

Section 9. Chapter three of the laws of eighteen hundred and eighty four and all other acts or parts of acts in conflict with any of the provisions of this act, are hereby repealed.

Section 10. This act shall take effect from and after its first publication in the official state paper.

Approved March 7, 1885.

Kentucky.

From laws of the state of Kentucky relating to the public health and sanitary memoranda. VIII. Diseases of cattle—pleuro-pneumonia, glanders, rabies—Chapter 324, acts 1886. An act in relation to infectious and contagious diseases in cattle.

Section 1. Be it enacted by the general assembly of the Commonwealth of Kentucky: Whenever any contagious or infectious disease affecting cattle shall exist in this state, it shall be the duty of the state

rd of health to take measures to suppress the same promptly and ctively to prevent the same from spreading.

'ection 2. For such purpose the state board of health shall have ver, to issue their proclamation, stating that infectious or contagious ease exists in any county or counties of the state, and warning all sons to seclude all animals in their possession that are affected with h disease or has been exposed thereto, and ordering all persons to e such precautions against the spreading of such disease as the ure thereof may, in their judgment, render necessary or expedient; rder that any premises, farm or farms, where such disease exists or existed, to be put in quarantine at the owner's expense, so that cattle may be removed from or brought to the premises so quaran- d, and to prescribe such regulations concerning the mode of quar- ine as they may judge necessary or expedient to prevent infection ontagion being communicated in any way from the places so quar- ined; to call on the sheriffs and deputy sheriffs to assist in enforc- and carrying out the provisions of such proclamations and orders se duty it shall be to observe and obey all such orders and procla- tions; to employ a veterinary surgeon and practioner, and such er persons, as may be necessary from time to time, in performing ir duties as set forth in the provisions of this act; and to prescribe ulations for the destruction of such animals and, for the proper dis- ition of their hides and carcasses, and of all objects which might vey infection or contagion at the owners expense: *Provided*, That animal shall be destroyed by said board, unless first examined by eterinary practioner, acting in the employ or under the direction of l board, or unless the owner thereof knows that such cattle is so cted. Said board shall also have power to prescribe regulations the disinfection of all premises, buildings, and railway cars and all ects by or from which infection may take place or be conveyed; to r, modify, cancel or withdraw any of said proclamations, orders, or ulations, whenever they may deem proper to do so.

'ection 3. Any person knowingly transgressing, violating, or failing comply with the terms of any proclamation, order, or regulation ted or prescribed by the board, shall be guilty of a misdemeanor, , on indictment, be fined in a sum not less than $200 nor more than 00. And any person or persons, being the owner of any cattle cted with the contagious disease known as pleuro-pneumonia, and owing the same to be so affected, who fails to kill and bury or burn m, or fails to report the same at once to the state board of health, ll be fined for each offense in a sum not less than $200 nor more n $1000, in the direction of the jury, and the said board upon the ure of any such person to immediately kill said diseased cattle when ered by the board to do so, shall have the right to kill the same at owner's expense.

Section 4. Any person bringing cattle into this commonwealth, having said disease, pleuro-pneumonia, and knowing or having reasonable grounds to believe the same to be so affected, shall be deemed guilty of a felony, and, on indictment and conviction, be confined in the penitentiary not less than one nor more than four years, in the discretion of the jury.

Section 5. Any person being the owner of cattle affected with pleuro-pneumonia, and knowing the same to be so affected, or knowing the same to have been exposed thereto, who drives or causes the same to be driven upon a public highway, or sells or transfers the same to another, shall, on indictment and conviction, be fined the sum not less than $200 nor more than $1000, in the discretion of the jury.

Section 6. The state board of health shall have the power to employ a veterinarian, who shall be a regular practioner, and a graduate of some college of veterinary surgery and practice, whose duty it shall be to redner such service under this act as the board may direct. Said veterinarian shall be entitled, for the services rendered, to a sum not exceeding five (5) dollars per day and traveling expenses, for the time he is actually engaged at work for said board, to be paid by the county court of the county in which the disease is prevailing. The veterinarian shall receive nothing from any other person for examinations and work done at the instance of said board, and in the event he does he shall, upon indictment and conviction, be fined in a sum not less than $200 nor more than $1000, in the discretion of the jury.

Section 7. In order to effectually carry out the provisions and intentions of this act, the said board may engage and obtain the services of any veterinarian in the employ of the Federal Government of the United States, and otherwise coöperate with the proper department of said Federal Government in the suppression of said disease in this commonwealth.

Section 8. The governor shall, in addition to the number of persons now on said state board of health, appoint three discreet, intelligent house keepers engaged in the cattle business, whose duty shall be to serve on said board without any charge for services, but said three persons shall only have the right and power to act thereon with reference to matter embraced in this act.

Section 9. If any person shall be convicted of a violation of the third, fourth, or fifth sections of this act, the jury shall have power to determine by their verdict whether or not such person is, at the time of his trial and conviction, the owner of any cattle which have been exposed to said disease, by having been within the same enclosure with a diseased animal within four months next before the trial and if they find he has such cattle they will find the number, sex, and distinguishing marks, and it shall be the duty of the court to order the destruction of

said cattle by the sheriff at the owner's expense, and the expense thereof shall be taxed as costs in the case.

Section 10. In order the more effectually to stamp out the said disease in this commonwealth and to encourage those persons whose cattle may be affected therewith or exposed thereto, to make the same known, the sum of three thousand dollars is appropriated out of any money that may be in the treasury not otherwise appropriated, for which sum the auditor shall, at the request of the State board of health, draw his warrant in their favor on the treasurer. Said board may use said sum, or any part of it, in their discretion, for the purchase and destruction of any cattle which may have been exposed to said disease, but which do not actually have the same, and if all of said sum is not used, they shall return the remainder to the treasury.

Section 11. In purchasing said cattle, said board shall in no case pay more than $30 for any one animal, nor shall they pay for any cattle whose owner has concealed the existence of said disease among his cattle or on his premises, or has in any way, by intentional act or by wilful neglect, contributed to the spread of the disease.

Section 12. Should said disease make its appearance hereafter in any portion of the state where it has not heretofore existed, the governor, if the general assembly is not in session, shall have the power to direct the application by said board of a sum not exceeding $3000, for the purpose of paying for such cattle as may be exposed to, but not actually affected by said disease, upon the conditions and limitations herein before prescribed, and such other conditions and limitations as he may prescribe. Said sum, upon the written order of the governor, shall be paid to said board out of the treasury, upon warrant of the auditor.

Section 13. The board of health shall keep and report to the general assembly, an itemized account of their expenditures under this act.

Section 14. Whenever the state board of health shall have information of the existence of pleuro-pneumonia in any other state or country, they shall have power to quarantine against the cattle of such state or locality, to prevent the importation of said disease into this commonwealth, upon such terms and conditions as the said board may prescribe.

Section 15. The veterinarian selected by the state board of health, shall be known as the state veterinarian.

Section 16. This act shall take effect from and after its passage.

Became a law, March 11, 1886.

Chapter 9, Pages 178-9, General Statutes.

Section 5. If the owner of any distempered cattle shall permit them to run at large outside his enclosure, or shall drive the same into or through any part of this commonwealth, unless it be from one portion of his own enclosure to another, he shall forfeit and pay the sum of ten

dollars for each head; and when any such cattle shall die, the owner thereof shall cause them to be burned or buried: and if he fail, he shall be fined five dollars for each offense.

Section 6. If a justice of the peace be informed by affidavit, that the owner of such cattle as are described in the preceding section has violated its provisions, it shall be his duty to issue his order, in the name of the commonwealth, to such owner, commanding him to impound them: and if he fail or refuse to do so, or permit them to escape, or to be taken from the pound before the disease has been removed, he shall have power to order the cattle to be killed and burned at the expense of the owner.

Article XVIII, Chapter 29, Page 347, General Statutes.

Section 3. If any person shall bring into this state any of the cattle known as "Texas cattle?" he shall be fined not less than $500 nor more than $5000; but if such cattle be brought into this state in the months of December, January or February, the person so doing shall not incur the penalty aforesaid, if it is shown that disease was not spread thereby among the cattle of another person.

Section 5. It shall be the duty of any person owning a horse, mule, jack or jennet, affected with glanders, to kill such animal, and cause the same to be either burned or buried; and if he fails to do so, he shall be fined not less than $20 nor more than $100.

Section 6. If any person owning or having charge of a horsee, mule, jack or jennet, afflicted with glanders, shall knowingly permit such animal to run at large on his premises, so as to come in contact with animals belonging to others, and thereby spread the disease, or suffer such diseased animals to go upon the public highway, or shall sell or trade, convey or transfer, by gift or otherwise, an animal so diseased, he shall be fined not less than $20 nor more than $500.

Section 8, Chapter 1, Page 142, General Statutes.

It shall be the duty of any person owning a horse, mule, jack or jennet affected with glanders, to kill such animal and cause the same to be either burned or buried; and if he fail to do so, he shall be liable, by civil action, for all damages that may occur by the spreading of said disease.

Section 11, Chapter 21, Page 245, General Statutes.

"Cattle" includes horse, mule, ass, sheep, hog or goat, of any age or sex, bull, cow, calf and ox; cow includes heifer.

Louisiana

From letter of Dr. Solomon, Secretary State Board of Health.

"There is no law in this state relating to infectious or contagious diseases in cattle or other animals. The only law at all germane to the

subject is one requiring the inspection of food animals before slaughtering."

State of Maine.

CHAPTER 138.

An act to extirpate contagious disease among cattle.

Section 1. Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows: That for the purpose of facilitating and encouraging the live stock interest of the state of Maine, and for extirpating all insidious, infectious and contagious diseases, now or that may be among cattle and other live stock, and especially tuberculosis; the governor of the state is hereby authorized and required, immediately after the passage of this act, to appoint a board of cattle commissioners, consisting of three persons of known executive ability, who shall be charged with the execution of the provisions of this act, and who shall be known and designated as the "State of Maine Cattle Commission," and whose powers and duties shall be those provided for in this act, and whose tender of office shall be at the option of the governor. The compensation of said commissioners shall be at the rate of $3 per day during the time they are actually engaged in the discharge of their duties as commissioners. The said commissioners shall respectively take an oath to faithfully perform the duties of their office, and shall immediately organize as such commission, by the election of one of their number as president thereof, and proceed forthwith, to the discharge of the duties devolved upon them by the provisions of this act.

Section 2. That it shall be the duties of the said commissioners to cause investigation to be made as to the existence of tuberculoses, pleuro-pneumonia, foot-and-mouth disease, and any other infectious or contagious disease. And such commissioners are hereby authorized to enter any premises or places, including stock yards, cars, and vessels within any county, or part of the State in or at which they have reason to believe there exists any such diseases, and to make search, investigation and inquiry, in regard to the existence therof. Upon the discovery of the existence of any of the said diseases, the said commissioners are hereby authorized to give notice, by publication, of the existence of such disease, and the locality thereof, in such newspapers as they may select, and to notify, in writing, the officials or agents of any railroad, steamboat, or other transportation company doing business in or through such infected locality, of the existence of such disease; and are hereby authorized and required to establish and maintain such quarantine of animals, places, premises, or localities, as they may deem necessary to prevent the spread of any such diseases, and also to cause the appraisal of the animal or animals affected with, or that have been exposed to the said diseases, in accordance with such rules and regula-

tions by them, as hereinafter authorized and provided, and to pay, in case of diseased animals, the owner or owners thereof, three-fourths of their value, as determined upon the basis of health before infection, and the full appraised value in case of animals exposed to either of such diseases, but not themselves actually diseased out of any monies appropriated by the legislature for that purpose; provided, however, that they shall not pay more than $200 for an animal with pedigree recorded or recordable in the recognized herd-books of the breed in which the animal destroyed may belong, nor more than $100 for an animal which has no pedigree: provided, further, that in no case shall compensation be allowed for an animal destroyed under the provisions of this act, which may have con tracted or been exposed to such disease in a foreign country, or on the high seas: nor shall compensation be allowed to any owner who in person or by agent, knowingly and wilfully conceals the existence of such disease, or the fact of exposure thereto in animals of which the person making such concealment, by himself, or agent, is in whole or part owner.

Section 3. That the said commissioners are hereby authorized and required to make, record, and publish rules and regulations providing for and regulating the agencies, methods, and manner of conducting and the investigations aforesaid, regarding the existence of said contagious diseases; for ascertaining, entering and searching places where such diseased animals are supposed to exist; for ascertaining what animals are so diseased, or have been exposed to contagious diseases; for making, reporting and recording descriptions of the said animals so diseased or exposed and destroy and for appraising the same, and for making payment therefor; and to make all other needful rules and regulations which may, in the judgment of the commissioners be deemed requisite to the full and due execution of the provisions of this act. All such rules and regulations, before they shall become operative shall be approved by the governor of Maine, and thereafter published in such a manner as may be provided for in such regulations; and after such publication said rules and regulations shall have the force and effect of law so far as the same are not inconsistent with this act and other laws of the state, or United States.

Section 4. That any person who shall knowingly and wilfully refuse permission to said commissioners, or either of them, make, or who knowingly or wilfully obstructs said commissioners or either of them in making all necessary examinations of, and as to animals supposed by said commissioners to be diseased as aforesaid, or in destroying the same, or who knowingly attempts to prevent such commissioners, or either of them, from entering upon the premises and other places hereinbefore specified where any of said diseases are by said commissioners supposed to exist, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, or of either of the acts in this section prohibited,

shall be punished by fine not exceeding one hundred dollars, or by imprisonment not exceeding ninety days, or by both fine and imprisonment at the discretion of the court.

Section 5. That any person who is the owner of, or who is possessed of any interest in any animals affected with any of the diseases named in section two of this act, or any person who is agent, common carrier, consignee or otherwise is charged with any duty in regard to any animal so diseased, or exposed to the contagion of such disease, or any officer or agent charged with any duties under the provisions of this act, who shall knowingly conceal the existence of such contagious disease, or the fact of such exposure to said contagion, and who shall knowingly and wilfully fail, within a reasonable time, to report to said commissioners, their knowledge or their information in regard to the existence and location of said disease, or of such exposure thereto, shall be deemed guilty of a misdemeanor, and shall be punished as provided in section four of this act.

Section 6. That when the owner of animals decided under the provisions of this act, by the proper authority, to be diseased, or to have been exposed to contagion, refuses to accept the sum authorized to be paid under the appraisement provided for in this act, it shall be the duty of the commissioners to declare and maintain a rigid quarantine as to the animals decided, as aforesaid, to be diseased or to have been exposed to any contagious or infectious disease, and of the premises or places where said cattle may be found, according to the rules and regulations to be prescribed by said commissioners, approved by the governor and published as provided in the third section of this act.

Section 7. That no person or persons owning or operating any railroad, nor the owner or owners, or masters of any steam, sailing, or other vessels within the state, shall receive for transportation, or transport from one part of the state to another part of the state, or to bring from any other state or foreign country any cattle affected with any of the diseases named in section two of this act, or that has been exposed to such diseases, especially the disease known as tuberculoses, knowing such cattle to be affected or to have been so exposed, nor shall any person or persons, company or corporation, deliver for such transportation to any railroad company, or to the master of owner of any vessel, any cattle, knowing them to be affected with or to have been exposed to any of the said diseases; nor shall any person or persons, company or corporation, drive on foot or transport in private conveyance, from one part of the state to another part of the state any cattle, knowing the same to be affected with or to have been exposed to any of said diseases. Any person or persons violating the provisions of this section shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by fine not exceeding the sum of two hundred

dollars, or by imprisonment not exceeding six months, or by both fine and imprionment.

Section 8. That it shall be the duty of the several county attorneys to prosecute all violations of this act, which shall be brought to their notice or knowledge by any person making complaint under oath; and the same shall be heard in any supreme judicial court having jurisdiction in the county in which the violation of this act has been committed.

Section 9. That the said commissioners are hereby authorized to appoint or elect one of their number as secretary of said board, who shall receive a reasonable compensation for its services, during the time in which, under the provisions of this act, the services of commissioners shall make and preserve a full record of all rules and regulations promulgated under the provisions of this act, of all payments and expenses hereunder incurrod, and all other transactions performed by said commissioners in the discharge of their duties as herein provided: and the said commissioners shall, on or before the first Wednesday in January, of each year, during their continuance in service and at other times as they may deem conducive to the public interests, or as they may be required so to do by the governor of the state, report to said governor, full and accurate accounts of their expenditures, and other proceedings under the provisions of this act, and of the condition of said diseases, if any, in the state, to be communicated by him to the legislature. Whenever the functions of said commission shall be suspended or terminated, it shall turn over to the secretary of state, all its books, papers, records and other effects taking his receipt therefor, and he shall remain the custodian of the same until such time as the functions of said commission may be restored.

Section 10. That the commissioners shall have power and are hereby authorized to employ skilled veterinarians, and such other agents and employés as they may deem necessary to carry into effect the provisions of this act, and to fix the compensation of the person or persons so employed, and to terminate such employment at their discretion; and they are authorized out of the monies by this act appropriated, to make such expenditures as may be needed for the actual and necessary traveling expenses of themselves and their said employés, stationery, expenses of disinfecting premises, cars and other places, destroying diseased and exposed animals and paying for the same, and such other expenses and expenditures as they find to be actually necessary to properly carry into effect the provisions of this act.

Section 11. That the monies appropriated by this act shall be paid over to the secretary of said commission, from time, to time as the same may be found to be needed, upon requisition made by the said commissioners, and shall be disbursed by the said secretary of said commision only upon vouchers approved by said commissioners or a majority of them. The said secretary shall before entering upon the

duties of his office, take an oath to faithfully discharge the duties thereof, and shall enter into a bond to the state of Maine, with sureties to be approved by the treasurer of state, in such sum as he may designate, for the faithful acounting of all monies received by the said secretary of the commission, under the provisions of this act.

Section 12. That for the purpose of carrying into effect the provisions of this act, the sum of $5000, or so much thereof as may be necessary, is hereby appropriated out of any monies in the treasury not otherwise appropriated.

Section 15. That all acts and parts of acts inconsistent or in conflict with the provisions of this act, be, and the same are hereby repealed.

Approved March 17, 1887.

Laws of Maryland, 1888.

CHAPTER 519.

An act to prevent the spread of contagious or infectious diseases among the live stock of this state.

Section 1. Be it enacted by the general assembly of Maryland, that a commission is hereby established which shall be known under the name and style of the "state live stock sanitary board," to consist of three commissioners, who are practically engaged in the breeding of live stock, who shall be appointed by the governor, by and with the advice and consent of the senate, biennially, at such a time as executive appointments are required by law to be made, and who shall hold their offices until their successors are duly appointed and qualified.

Section 2. And be it enacted, that it shall be the duty of said board, as far as possible to protect the health of the domestic animals of the state from all exotic contagious or infectious diseases, and glanders in horses, and for this purpose it is authroized and empowered to establish, maintain and enforce such quarantine, sanitary or other regulations as it may be necessary, and shall maintain an office in the city of Baltimore; it shall institute and constitute diligent inquiries in the several counties and ascertain, as far as possible, the exact condition of the health of the live stock in said counties, and the local boards of health of the several counties, shall investigate all reported cases of contagious or infectious diseases of live stock in their respective counties and if found to be contagious or infectious shall report the same at once to the said live stock sanitary board, and such board, shall have power to prevent the introduction into this state of animals from other states which they have reason to believe are affected with a contagious or infectious disease. or have been exposed thereto, and to detain the same at any place for inspection for quarantine in its discretion.

Section 3. And be it enacted, that on presentation to the governor by the said "live stock sanitary board" of the facts, showing the ex-

istence of any contagious or infectious disease among the domestic animals of any other state, territory, or district, the governor may by proclamation declare such state, territory or district or any part thereof, in quarantine, and during the pendency of such quarantine, it shall not be lawful for any person or persons, company or corporation to bring into the state of Maryland any animal or animals of the kind so infected from the district so quarantined. And any person or persons, company or corporation, whether owner, agent or carrier convicted of a violation of the provisions of this section shall be subject to a fine of not less than $100, nor more than $500 for each offense.

Section 4. And be it enacted, that each member of said board shall be paid the sum of $5 per day and necessary expenses for time, actual expense in the discharge of his duty. And the sum of $3,000 per year be and the same is hereby appropriated, or so much thereof as may be necessary to meet the expenses of said board, including rent, printing counsel fees, etc.

Section 5. And be it enacted, that the governor shall appoint a chief veterinary inspector, who shall be a graduate in good standing of some recognized school of veterinary medicine, who shall hold his office and be paid a salary not exceeding $1000 and traveling expenses, in the discretion of the governor, whose duty it shall be to visit the stables of the city and counties whenever and wherever he has reason to believe contagious or infectious disease may exist, and he may visit any such stable at any hour of the day, between sunrise and sunset, and shall have power with the consent of the said live stock sanitary board, to order all animals which have been exposed to such contagion or infection, to be isolated in such manner as the nature thereof may in his judgment, render necessary to prevent the spreading of such disease; to order that any premises, farm or farms, stables or railway cars, where such disease exists, or has existed, be put in quarantine, so that no domestic animals of the same species, shall be removed from or brought to the premises or places so quarantined until the same shall have been properly disinfected; to prescribe such regulations as he may judge necessary or expedient to prevent infection or contagion being communicated in any way from the places so quarantined; to call upon all sheriffs and deputy sheriffs, constables, policemen or other officers of the state, the city of Baltimore, or of any county, for information and assistance to carry out and enforce the provisions of such orders and regulations; to prescribe regulations for the destruction of animals affected with or exposed to an infectious or contagious disease, and for the proper destruction of their hides and carcasses, and all objects which might carry infection or contagion; to prescribe regulations for the disinfection of all buildings, premises, and railway cars, and all objects from which, or by which infection or contagion might take place or be conveyed; to alter and modify from time to time as he may deem expedient, the terms

of all such orders and regulations, and to cancel or withdraw the same at any time; and it shall be the duty of all sheriffs, or deputy sheriffs, constables, policemen or other officers of the states, city of Baltimore or counties to obey and observe, all orders and instructions which they may receive from said veterinarian inspector in the enforcement of the provisions of this act within their respective jurisdiction.

Section 6. And be it enacted, that any person who shall violate or transgress the terms or requirements of any order or regulation issued and prescribed by the said veterinary inspector, with the consent of the said live stock sanitary board, under the authority of this act, or shall refuse the said veterinary inspector, or his assistants, access to his, her or their premises, farms, stables, cars, sheds or pens, or shall resist said Inspector or his assistants in applying any of the quarantine orders or regulations, or shall conceal the fact that contagious or infectious disease exists on his premises, shall be subject to a fine of not more than $100 nor less than $50, which fine may be imposed by any justice of the peace of the city of Baltimore, or any county where such offense may be committed.

Section 7. And be it enacted, that it shall be the duty of all persons practicing veterinary medicine in this state, to report immediately to said board all cases of contagious or infectious disease among live stock which may come to their knowledge, and a failure to so report for 48 hours after he or they shall come into such knowledge, shall be deemed a misdemeanor, and on conviction thereof, he or they shall be fined not exceeding $50 for each offense.

Section 8. And be it enacted, that it shall be unlawful for any person to inoculate any animal in this state with the virus of any infectious or contagious disease incident to animals, without the consent of the said live stock sanitary board, and that any person convicted of this offense shall be fined a sum not less than one nor more than $500 in the discretion of the court.

Section 9. And be it enacted, that for the performance of the duties imposed on them by this act all constables, sheriffs or deputy sheriffs or other state officers, shall be paid as for the performance of similar duties under existing laws.

Section 10. And be it enacted, that all rules and regulations formulated and issued by said board in pursuance of the powers hereby conferred on it, shall have the force and effect of laws, and all violations of such rules and regulations shall be punished as misdemeanors are punished at common law, and all appraisements of animals to be slaughtered, or of buildings to be destroyed, shall be approved by said board before such animals are slaughtered, or such buildings are destroyed; and said board shall have the discretion to have such animals slaughtered or quarantined.

Section 12. And be it enacted, that any person who shall sell or

otherwise dispose of an animal which he knows, or has good reason to believe, is affected with any contagious or infectious disease, or has been exposed thereto within ninety days, or shall permit the same to pass over or upon any public highway, street, lane or alley, or to graze any unfenced lot or piece of ground without the consent of the said board, shall on conviction thereof be fined not less than $50 nor more than $100 for each animal so driven or exposed; such fine may be imposed by any justice of the peace of the city of Baltimore, or county where the offense shall be committed.

Section 13. And be it enacted, that it shall be unlawful for any person or persons to wilfully expose any animal to others affected with a contagious or infectious disease,or to put or suffer to be put any healthy or unexposed animal of the same species into any stable, or on any premises which have been declared to be infected, until the same shall have been declared to be free from such infection by the said veterinary inspector with the consent of said board; any person or persons convicted of violating any of the provisions of this section shall be subject to a fine of not less than $1 nor more than $500 for each offense; and the animal or animals so introduced into such infected stables or premises, shall be slaughtered by said veterinary inspector without appraisement or compensation from the state.

Section 14. And be it enacted, that in the event of any building or buildings, sheds, stables, stable furniture, hay, straw or fodder, being reported to the said board by said inspector as being incapable of proper disinfection, the said board may in its discretion, have such buildings and articles so infected, appraised as hereinafter provided for the appraisement of animals, and destroyed.

Section 15. And be it enacted, that in the event of its being deemed necessary for the said veterinary inspector and said board to prevent the spread of contagious or infectious disease, to cause any animal or animals so diseased or exposed to such disease to be slaughtered, the value of such animal or animals shall be appraised in their then condition by two sworn appraisers, to be sworn before any officer authorized to administer oaths and affirmations, one of which appraisers to be appointed by the owner or custodian of such animals, the other by the said veterinary inspector, or in case the said owner or custodian of such animals shall neglect or refuse to name such appraisers, then by two appraisers, to be appointed by said inspector, who, in case of disagreement shall call in a third, which said appraisement when approved by said board, shall be filed with the comptroller,and the comptroller shall forthwith issue his warrant to the treasurer for the amount of said appraisement, in favor of the said owner or owners, and if the owner or owners of such animals or buildings or other property shall not be satisfied with the amount of said appraisement, he or they may, within sixty days appeal to the circuit court of the county, or to the Balti-

more city court, if such animals or buildings are within the city of Baltimore, by filing in said court a copy of such appraisement with a petition for writ of subpoena against the said veterinary inspector, which appeals shall be acted on by said court in the same manner as appeals from justices of the peace.

Section 16. And be it enacted, that the said board is hereby authorized and empowered to agree with the Bureau of Animal Industry of the Department of Agriculture of the United States, or other properly constituted authority of the United States for co-operation in the work of eradicating any contagious or infectious disease among live stock in the state of Maryland, but such agreement shall provide that such work shall be under the control of the state authorities.

Section 17. And be it enacted, that in the event of an epidemic of contagious or infectious disease among the live stock of this state, it shall be the duty of the said board to appoint such assistants to said inspector as may be necessary to promptly suppress the same and to fix their pay.

Section 18. And be it enacted, that all diseased animals, that under the provision of this act shall be slaughtered at any slaughter house where meat is prepared for market, shall be slaughtered under the supervision of the chief veterinary inspector or his assistant, and it shall be the duty of said inspector to see that the carcasses and offal of such diseased animals, whether such disease was contagious or otherwise, are destroyed and not sold for food, and any inspector who shall corruptly pass as healthy a diseased animal shall on conviction thereof be fined not exceeding five hundred dollars and forfeit his commission.

Section 19. And be it enacted, That all acts or parts of acts inconsistent with this act be any and they are hereby repealed, provided nothing herein shall affect the commissions or terms of office of the chief veterinary inspector and members of said sanitary board appointed and confirmed at this session of the general assembly, nor shall any prosecution now pending for violation of the acts of eighteen hundred and eighty-four, chapter one hundred and fifty-seven and eighteen hundred and eighty-six, chapter eighty, abate, but the same shall be prosecuted to final judgment under the provisions of said acts as if this act had not been passed.

Section 20. And be it enacted, That this Act shall take affect from the date of its passing.

Approved this fifth day of April, 1888.

MASSACHUSETTS.

From the Manual for the use of the Boards of Health.

156. The governor, with the advice and consent of the council, shall appoint a board of cattle commissioners of not more than three members, whose term of office shall commence on the first day of October,

eighteen hundred and eighty-five, and who shall hold office as follows: one of said members for the term of three years, one for the term of two years, one for the term of one, year, and thereafter one of the said members shall be appointed annually for the term of three years. The compensation of such commissioners shall not exceed five dollars per day for actual service, in addition to their traveling expen ses necessarily incurred. Any member of the board may be removed by the governor and counci. And they may terminate the commissions of the entire board when in their judgment the public safety may permit. Vacancies in the board by the expirations in the terms of service or otherwise shall from time to time be filled by appointment by the governor with the consent of the council. The board of cattle commissioners as now constituted shall cease to exist on the thirteenth day of September, eighteen hundred and eighty-five, and the duties now devolving by law upon said board shall thereafter be performed by the Board authorized bv this Act. (1885, 378.)

107. It shall be the duty of the cattle commissioners to make inquiries and gather facts and statistics in relation to the prevalence among the meat stock of this State, of the disease know as abortion, the annual losses caused thereby and its effect of the healthyness of milk as an article of food. (1884, 232, 1.)

171. To ascertain the real character of the disease, its cause, and the best methods of its cure or prevention, the commissioners may make or cause to be made experiments, investigations and examinations, and for this purpose shall have and exercise all the powers conferred upon them in cases of contagious diseases by the provisions of section fourteen of chapter ninety of the public statutes. (1884, 232, 2.)

172. The commissioners for the purpose of aiding them in their investigations may kill any animal affected with said disease, and such animal shall be paid for in section seventeen of chapter ninety of the public statutes. Said commissioners shall make a detailed statement in their annual report of their doings under the provisions of this act. (1884, 232, 3.)

CHAPTER 252.

An act for the suppression of contagious diseases among domestic animals.

Be it enacted, etc., as follows:

Section 1. The boards of health of cities and towns, in case of the existence in this commonwealth of the disease called pleuro-pneumonia among cattle, or farcy or glanders among horses, or any other contagious or infectious disease among domestic animals, shall cause the animals which are infected or which has been exposed to infection in their respective cities and towns, to be secured or collected in some suitable place or places within their cities or towns, and kept isolated; and when taken from the premises or possession of their owners, the expenes

of their maintenance shall be paid by the city or town wherein the animal is kept, and four fifths of such payment, when certified by the treasurer of such city or town, shall be refunded by the commonwealth; such isolation to continue as long as the existence of such disease or other circumstances may render it necessary.

Section 2. They may, within their respective cities and towns, prohibit the departure of animals from any enclosure or exclude animals therefrom, and may appoint agents who shall have power to enforce the prohibitions and regulations for which provision is made in sections three and four of this act.

Section 3. They may make regulations in writing to regulate or prohibit the passage from, to or through their respective cities or towns, or from place to place within the same, of any cattle or other domestic animals, and may arrest and detain at the cost of the owners thereof all animals found passing in violation of such regulations; and may take all other necessary measures for the enforcement of such prohibition, and also for preventing the spread of any disease among the animals of their respective cities and towns in the immediate vicinity thereof.

Section 4. Such regulations shall be recorded upon the records of their cities and towns in such manner as may be provided in such regulations.

Section 5. Any person disobeying the orders of the boards of health made in conformity with section 3, or driving or transporting any animals contrary to the regulations made, published and recorded as aforesaid shall be punished by a fine not exceeding five hundred dollars, or by imprisonment not exceeding one year.

Section 6. Whoever has knowledge of, or has good reason to suspect the existence of a contagious disease among any species of domestic animals in this state, whether such knowledge is obtained by personal examination or otherwise, shall forthwith give notice thereof to the board of health of the city or town where such diseased animals are kept; and for failure so to do, shall be punished by a fine not exceeding five hundred dollars, or by imprisonment in jail not exceeding one year.

Section 7. The board of health of a city or town having received notice of a suspected case of contagious disease among any of their domestic animals in their city or town, shall forthwith make an examination thereof personally, or by a competent person appointed by them for that purpose, and if satisfied there are good reasons for believing that contagion is present, shall immediately inform the cattle commissioners.

Section 8. A city or town whose officers refuse or neglect to carry into effect the provisions of the first four and the seventh sections of this act, shall forfeit a sum not exceeding five hundred dollars for each day's neglect.

Section 9. The boards of health of cities and towns, when in their judgment it is necessary to carry into effect the provisions of this chapter, say within their respective cities and towns, take and hold for a term not exceeding one year, any land, without buildings other than barns thereon, upon which to enclose and isolate any animals; and they shall cause the damage sustained by the owner in consequence of such taking and holding to be appraised by the assessors of the city or town wherein the lands so taken are situated; and they shall further cause a description of such land, setting forth the boundaries thereof, and the area as nearly as may be estimated, together with the said appraisal, to be entered upon the records of the city or town. The amount of said appraisement shall be paid as provided in section 1, in such sums and at such times as the board of health may order. If the owner of the land so taken is dissatisfied with said appraisement, he may by action of contract, recover of the city or town wherein the lands lie, a fair compensation for the damages sustained by him, but no costs shall be taxed unless the damage recovered in such action, exclusive of interest, exceed said appraisement. And the commonwealth shall reimburse to the city or town four-fifths of any sum recovered of it in any such action.

Section 10. When a board of cattle commissioners, appointed in accordance with the provisions of chapter 378 of the acts of the year eighteen hundred and eighty-five, is in existence, and makes and publishes any regulations concerning the extirpation, cure or treatment of animals infected with, or which have been exposed to any contagious disease, such regulations shall supercede those made by boards of health, and boards of health shall carry out and enforce all orders and directions of said commissioners to them directed.

Section 11. Said commissioners shall have all the power and authority herein conferred upon boards of health, and in addition may establish hospitals or quarantines with proper accommodations, wherein, under prescribed regulations, animals by them selected may be confined and treated, for the purpose of determining the varying characteristics of, and the methods by which a specific contagion may be disseminated or destroyed; and they may direct boards of health to enforce and carry into effect, all such regulations as may from time to time be made for that end. And any such officer who refuses or neglects to carry out any such regulation of the commissioners, shall be punished by a fine not exceeding five hundred dollars for every such offense.

Section 12, The commissioners, when in their judgment the circumstances of the case and the public good require it, may cause to be killed and buried any domestic animals which are infected with or have been exposed to contagious disease; and except as is provided in the following section shall cause such animals to be appraised by three competent, disinterested men, under oath, at the fair value thereof in their condition at the time of appraisement, and the amount of ap-

praisement, and necessary expense of the same shall be paid as provided in section one.

Section 13. When the commissioners, by an examination of a case of contagious disease among domestic animals, become satisfied that it has been contracted by intention or negligence on the part of the owner, or of a person in his employ or by his consent, or by the use of food material liable to contain the germs of contagion, they shall cause such animals to be securely isolated at the expense the owner, or they shall cause them to be killed without appraisal or payment; and in all cases of farcy or glanders, the commissioners having condemned the animal infected therewith, shall cause such animal to be killed without an appraisal, but may pay the owner, or any other person, an equitable sum for the killing and burial thereof.

Section 14. A person who fails to comply with a regulation made or an order given by the commissioners in the discharge of their duty, shall be punished by a fine not exceeding five hundred dollars, or by an imprisonment not exceeding one year.

Section 15. Prosecutions under the preceding section may be maintained in any county.

Section 16. All appraisements under this chapter shall be in writing and signed by the appraisers and certified by the boards of health or commissioners, respectively, to the treasurers of the cities and towns where the animals are kept, and forwarded to the auditor of the commonwealth.

Section 17. The commissioners may examine under oath all persons believed to possess knowledge of material facts concerning the existence or dissemination or danger of dissemination of contagious disease among domestic animals; and for this purpose shall have all the powers vested in justices of the peace to take depositions, and to compel witnesses to attend and testify by chapter one hundred and sixty-nine of the Public Statutes. All costs and expenses incurred in procuring the attendance of such witnesses shall be allowed and paid to the commissioners from the treasury of the commonwealth upon being certified to and approved by the state auditor.

Section 18. When animals exposed to contagious diseases are killed by order of the commissioners, their carcasses may be inspected by the commissioners or a competent, discreet person appointed by them, and if they are found entirely free of disease and in a wholesome condition for food they may be sold by them or by their order, and the proceeds of the sales shall be applied in payment of the appraised valued of said animals.

Section 19. Cattle commissioners now or hereafter appointed shall keep a full record of their doings, and report the same to the legislature on or before the tenth day of January in each year, unless sooner re-

quired by the governor; and an abstract of the same shall be printed in the annual report of the board of agriculture.

Section 20. When animals are transported within this state from infected localities beyond its boundary lines, such animals may be seized and quarantined by the commissioners at the expense of the owners thereof, so long as the public safety may require, and if in their judgment, it is necessary to secure that safety they may cause such animals to be killed without appraisal or payment for the same.

Section 21. No Texan, Mexican, Cherokee, Indian or other cattle, which the cattle commissioners decide may spread contagious diseases shall be driven on the streets of any city, town or village, or on any road in this commonwealth, nor shall they be driven outside the stockyards connected with any railway in this commonwealth, between the first day of March and the first day of November.

Section 22. In all stockyards within this commonwealth said Texan, Mexican, Cherokee, Indian or other cattle, which the cattle commissioners decide may spread contagious diseases shall be kept in different pens from those in which other cattle are kept, from the first day of March until the first day of November.

Section 23. Any person or persons violating any provision of the two preceding sections shall be punished by a fine of not less than twenty nor more than one hundred dollars.

Section 24. Chapter ninety of the the Public Statutes and chapter one hundred and forty-eight of the acts of the year eighteen hundred and eighty-five are hereby repealed: *Provided*, that nothing herein contained shall affect any prosecution pending, or any penalty incurred before this act takes effect. (Approved May 6, 1887.)

Resolution concerning the eradication of pleuro-pneumonia among cattle in the United States.

Resolved, That the Senators and Representatives of Massachusetts in the United States Congress are requested to use their best endeavors to secure the enactment of a law during the present session for the eradication of pleuro-pneumonia among cattle in the United States.

In House of Representatives, adopted February 4, 1887.

In Senate, adopted in concurrence, February 9, 1887.

CHAPTER 250.

An act to coöperate with the United States in the suppression and extirpation of pleuro-pneumonia.

Be it enacted, etc., as follows:

Section 1. That the Governor is hereby authorized to accept on behalf of the state the rules and regulations prepared by the commissioner of agriculture, under and in pursuance of section three of an act of congress approved on the twenty-ninth day of May, in the year eighteen

hundred and eighty-four, entitled "an act for the establishment of a bureau of animal industry, to prevent the exportation of diseased cattle and to provide means for the suppression and extirpation of pleuro-pneumonia and other contagious diseases among domestic animals," and to co-operate with the authorities of the United States in the enforcement of the provision of said act.

Section 2. The inspectors of the bureau of animal industry of the United States, shall have the right of inspection, quarantine and condemnation of animals affected with any contagious, infectious or communicable disase, or suspected to be so affected, or that have been exposed to any such disease, and for these purposes are hereby authorized and empowered to enter upon any ground or premises. Said inspectors shall have the power to call on sheriffs, constables and peace officers, to assist them in the discharge of their duties in carrying out the provisions of the act of congress approved on the twenty ninth day of May, in the year eighteen hundred and eighty-four, establishing the bureau of animal industry; and it is hereby made the duty of sheriffs, constables and peace officers to assist said inspectors when so requested; and said inspectors shall have the same powers and protection as peace officers while engaged in the discharge of their duties.

Section 3. All expenses of quarantine, condemnation of animals exposed to disease and the expenses of any and all measures that may be used to suppress and extirpate pleuro-pneumonia shall be paid by the United States, and in no case shall this state be liable for any damages or expenses of any kind under the provisions of this act.

Section 4. This act shall take effect upon its passage.

Approved May 4, 1887.

AN ACT

To provide for the appointment of a Live Stock Sanitary Commission and a State Veterinarian, and to prescribe their power and duties, and to prevent and suppress contagious and infectious diseases among the live stock of the state.

Act No. 182, Laws of 1885.

Section 1. The people of the State of Michigan enact, That a commission is hereby established which shall be known under the name and style, "the state live stock sanitary commission." The commission shall consist of three commissioners who are practical agriculturists and engaged in the live stock industries of the state, who shall be appointed by the governor with the advice and consent of the senate. One shall be appointed for the term of six years, one for the term of four years, and one for the term of two years, whose term shall commence on the second Tuesday of July of the year in which they are appointed, and shall continue until their successors are appointed and qualified. And at each succeeding biennial session of the legislature there shall be appointed in like manner one commissioner, who shall hold his office six years, or until his successor is appointed and quali-

fied. The governor shall also appoint, with the advice and consent of the senate, a competent and skilled veterinary surgeon for the state, who, at the time of such appointment, shall be a graduate in good standing of a recognized college of veterinary surgery, and who shall hold his office for two years from the second Tuesday of July of the year he is appointed and until his successor is appointed and qualified. The governor shall also appoint every two years thereafter a competent and skilled veterinarian, having the qualifications above mentioned, whose term of office shall be for two years, or until his successor is appointed and qualified.

Section 2. Said commissioners and veterinary surgeon, before they enter upon the duties of their office shall each take and subscribe the constitutional oath of office and file the same with the secretary of state.

Section 3. Each commissioner shall receive the sum of three dollars per day and necessary expenses for the time actually spent in the discharge of his duties; and the veterinary surgeon shall receive the sum of five dollars per day and necessary expenses for time when employed.

Section 4. It shall be the duty of the commission to protect the health of the domestic animals of the state from all contagious or infectious diseases of a malignant character, and for this purpose it is hereby authorized and empowered to establish, maintain, and enforce such quarantine, sanitary and other regulations as it may deem necessary.

Section 5. It shall be the duty of any person who discovers, suspects, or has reason to believe that any domestic animal belonging to him or in his charge; or that may come under his observation, belonging to other parties, is affected with any disease, whether it be a contagious or infectious disease, to immediately report such fact, belief, or suspicion to the live stock sanitary commission, or a member thereof.

(As amended by Act No. 105, Public Acts, 1887.)

(Section 6. was repealed by Act No. 105, Public Acts, 1887)

Section 7. The commission, or any member thereof to whom the existence of any infectious or contagious disease of domestic animals is reported, shall forthwith proceed to the place where such domestic animal or animals are, and examine the same, and if in his or their opinion any infectious or contagious disease does exist, he or they shall prescribe such temporary quarantine and regulation as will prevent the spread of the contagion or infection and notify the state veterinarian, who shall forthwith proceed to the place where said contagious or infectious disease is said to exist, and examine said animal or animals and report his or their finding to the said commission, who then shall prescribe such rules and regulations, as in their judgment the exigencies of the case may require, for the effectual suppression and eradication of the disease, and for that purpose the said commission may list and describe the domestic animals affected with such disease and those

which have been exposed thereto and included within the infected district or premises, so defined and quarantined with such reasonable certainty as would lead to their identification, and no domestic animal liable to become infected with the disease or capable of communicating the same shall be permitted to enter or leave the district, premises, or grounds so quarantined, except by the authority of the commission. The said commission shall also from time to time give and enforce such directions, and prescribe such rules and regulations as to separating, mode of handling, treating, feeding and caring for such diseased and exposed animals as it shall deem necessary to prevent the two classes of animals from coming in contact with each other, and perfectly isolate them from all domestic animals which have not been exposed thereto, and which are susceptible of becoming affected with the disease, and the said commission and veterinarian are hereby authorized and empowered to enter upon any grounds or premises to carry out the provisions of this act. When in the opinion of the commission it shall be necessary to prevent the further spread of any contagious or infectious disease among the live stock of the state, to destroy animals affected with or which have been exposed to any such disease, it shall determine what animals shall be killed, and appraise the same, as hereinafter provided, and cause the same to be killed and the carcasses disposed of as in their judgment will best protect the health of domestic animals of the locality.

Section 8. When the commission shall have determined the quarantine and other regulation necessary to prevent the spread among domes tic animals of any malignant, contagious, or infectious disease found to exist among the live stock of the state, and given their order as hereinbefore provided, prescribing quarantine and other regulations, it shall notify the governor thereof, who shall issue his proclamation proclaiming the boundary of such quarantine and the orders, rules, and regulations prescribed by the commission, which proclamation may be published by written or printed hand bills posted within the boundaries or on the lines of the district, premises, places, or grounds quarantined: *Provided*, That if the commission decide that it is not necessary, by reason of the limited extent of the district in which such disease exists, that a proclamation shall be issued, then none shall be issued, but such commission shall give such notice as may to it seem best to make the quarantine established by it effectual.

Section 9. Whenever the commission shall direct the killing of any domestic animal or animals it shall be the duty of the commissioners to appraise the animal or animals condemned, and in fixing the value thereof the commissioners shall be governed by the value of said animal or animals at the date of appraisal.

Section 10. Whenever any live stock shall be appraised and killed by order of the commission, it shall issue to the owner of the stock so killed

a certificate showing the number and kind of animals killed, and the amount in their judgment, to which the owner is entitled, and report the same to the governor of the state, which certificate, if approved by the governor shall be presented to the auditor general, who shall draw his warrant on the state treasurer for the amount therein stated, payable out of any money in the treasury not otherwise appropriated.

Section 11. When any animal or animals are killed under the provisions of this act, by order of the commission, the owner thereof shall be paid therefor the appraised value as fixed by the appraisement hereinbefore provided for: *Provided*, The right of indemnity on account of animals killed by order of the commission under the provisions of this act, shall not extend to the owners of animals which have been brought into the state in a diseased condition, or from a state, country, territory, or district in which the disease with which the animal is affected, or to which it has been exposed, exists. Nor shall any animal be paid for by the State which may be brought into the state in violation of any law or quarantined regulation thereof, or the owner of which has violated any of the provisions of this act, or disregarded any rule, regulation, or order of the live stock sanitary commission or member thereof. Nor shall any animal be paid for by the state which came into the possession of the claimant with the claimant's knowledge that such animal was diseased, or was suspected of being diseased or of having been exposed to any contagious or infectious diseases.

Section 12. Any person who shall have in his possession any domestic animal affected with any contagious or infectious disease, knowing such animal to be so affected, or after having received notice that such animal is is so affected, who shall permit such animal to run at large, or who shall keep such animal where other domestic animals not affected by or previously exposed to such disease may be exposed to its contagion or infection, or he shall sell, ship, drive, trade, or give away such diseased animal or animals which have been exposed to such infection or contagion, or who shall move or drive any domestic animal in violation of any direction, rule, or regulation, or order establishing and regulating quarantine shall be deemed guilty of a misdemeanor and upon conviction thereof, shall be fined in any sum not less than ten dollars nor more than five hundred dollars for each of such diseased or exposed domestic animals which he shall permit to run at large or keep, sell, ship, drive, trade, or give away in violation of the provisions of this act: *Provided*, That any owner of any domestic animal which has been affected with or exposed to any contagious disease may dispose of the same, after having obtained of the state veterinarian a certificate of health for such animal.

Section 13. Any person who shall knowingly bring into this state any domestic animal which is affected with any contagious or infectious disease, or any animal which has been exposed to any contagious or in-

fectious disease, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in any sum not less than one hundred dollars nor more than five thousand dollars.

Section 14. Any person who owns or is in possession of live stock which is affected, or which is suspected or reported to be affected with any infectious or contagious disease, who shall wilfully prevent or refuse to allow the state veterinarian or commissioner or other authorized officer or officers to examine such stock, or shall hinder or obstruct the state veterinarian or other authorized officer or officers in any examination of, or in an attempt to, examine such stock shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in any sum not less than ten dollars nor more than five hundred dollars.

Section 15. Any person who shall wilfully violate, disregard, or evade or attempt to violate, disregard or evade any of the provisions of this act, or who shall wilfully violate disregard or evade any of the rules, regulations orders or directions of the live stock sanitary commission establishing and governing quarantine shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in any sum not less than ten dollars nor more than five hundred dollars.

Section 16. The commission provided for in this act shall have power to employ at the expense of the state such persons and purchase such supplies and material as may be necessary to carry into full effcet all orders by it given.

Section 17. The commissioners shall have power to call upon any sheriff, under sheriff, deputy sheriff or constable to execute their orders and such officers shall obey the orders of said commissioners, and the officers performing such duties shall receive compensation therefor as is prescribed by law for like services, and to be paid therefor in like manner. And any officer may arrest and take before any justice of the peace of the county any person found violating any of the provisions of this act, and such officer shall immediately notify the prosecuting attorney of such arrest, and he shall prosecute the person so offending according to law.

Section 18. Whenever the governor of the state shall have good reason to believe that any dangerous, contagious, or infectious disease has become epidemic in certain localities in other states territories or countries, or that there are conditions which render such domestic animals from such infected districts liable to coney such disease, he shall by proclamation prohibit the importation of any live stock, of the kind diseased into the state, unless accompanied by a certificate of health given by a duly authorized veterianry surgeon; and all such animals arriving in this state shall be examined immediately by the commission or some member thereof, and if he or they deem necessary he or they shall have said animals inspected by the state veterinary surgeon, and if in his opinion there is any danger from contagion or infection they

shall be placed in close quarantine until such danger of infection or contagion is passed, when they shall be released by order of said commission or some member thereof.

Section 19. For the purposes of this act each member of the live stock sanitary commission is hereby authorized and empowered to administer oaths and affirmations.

Section 20. This commission is hereby authorized and required to cooperate with any board or commissionacting under any present or future act of congress for the suppression and prevention of contagious or infectious diseases among domestic animals, and the same right of entry, inspectionand condemnation of diseased animals upon private premises is granted to the United States board or commission, as is granted to the commission granted under this act.

Section 21. The commission shall make, biennially, a detailed report of its doings to the governor, which report shall be transmitted to the legislature at its regular biennial session.

Section 22. This act shall be construed so as to include sheep and horses.

As amended by Act No. 47, Public Acts of 1887

Ordered to take immediate effect.

Approved June 10, 1885.

Section 23. Any railroad company, navigation company, or other corporation, or common carrier, who shall knowingly or wilfully violate, disregard or evade any of the rules, regulations, orders or direction of the live stock sanitary commission, establishing or governing quarantine, or who shall evade, or attempt to evade any quarantine proclamation of the governor of this state declaring quarantine limits, shall forfeit and pay to the people of the state of Michigan not less than five hundred dollars, nor more than five thousand dollars, for each and every offense, and shall be liable for all damages caused to any meat cattle by its or his failure to comply with the requirements of this Act.

This act is ordered to take immediate effect.

Approved May 13, 1887.

Section 23 was added by Act No. 105, Public Acts, 1887.

AN ACT

To regulate and provide for the carrying, yarding and feeding of so called Texas cattle, while in transit into or across this state, between the first day of April and the first day of November of each year.

Act No. 198, Laws of 1885.

Section 1. The people of the State of Michigan enact, That it shall not be lawful to transport any meat cattle into or across this state, yard or feed the same, that have been reared or kept south of the thirty-sixth parallel of north latitude, and that have not subsequently been kept continuously at least one winter north of said parallel, and which may

be brought within the limits of this state between the first day of April and the first day of November following, except in the manner hereafter provided.

Section 2. It shall be the duty of all railroad companies doing business in this state to receive and transport while in this state, the class of cattle mentioned in section one, only in cars that are branded or lettered legibly and distinctly and in plain view, the words "For the transportation Texas cattle only;" and they shall not permit or allow any other class of cattle to enter those cars between the first day of April and the first day of November following: *Provided*, That cattle coming from other states for transportation through this state when it is impossible to ascertain where they came from may be shipped in such cars but shall be treated in all respects as coming from the country south of the thirty-sigth parallel of north latitude.

Section 3. It shall be the duty of any railroad company, stock yard company, or private individual owning and operating any stock yard in this state, to receive as feed, the class of cattle mentioned in section one only in yards separate and apart from the yards used for the feeding or yarding of other cattle; and these yards shall be in the immediate vicinity and contiguous to a railroad side track, so that these cattle may not pass over any open common that might be crossed by other cattle; and said yards shall have a sign posted at the entrance thereto, on which shall be plainly lettered "For the yarding of Texas Cattle only," and no other cattle shall be admitted to these yards between the first day of April and the first day of November of each year.

Section 4. Any railroad company, stock yard company or private individual owning any stock yard in this state, who shall violate any of the provisions of sections one and two of this act, shall forfeit and pay to the people of the State of Michigan not less than fifty dollars nor more than five hundred dollars for each and every such offence, and shall be liable for any and all damages caused to any neat cattle by their failure to comply to the requirements of this Act.

Section 5. Any person or persons who shall knowingly or wilfully place or attempt to place any neat cattle or others than those mentioned in section one, in any car or yard provided for in section two or three of this act and branded and lettered as therein provided for between the first day of April and the first day of November following, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten dollars nor more than one hundred dollars, or be imprisoned not less than ten days nor more than sixty days, or both such fine and imprisonment in the discretion of the court.

Approved January 16, 1885.

As amended by Act No. 57, Laws of 1887.

AN ACT

For an act to prevent the spread of contagious or infectious diseases among cattle, horses and other domestic animals.

CHAPTER 200, General Laws of 1885.

Be it enacted by the Legislature of the State of Minnesota.

Section 1. The local board of health of towns, villages and cities in case of existence in this state of the disease called pleuro-pneumonia among cattle, or farcy or glanders among horses, or any other contagious or infectious disease among domestic animals, shall cause the animals in their respective towns, villages or cities, which are infected, or which have been exposed to infection, to be secured or collected in some suitable place or places within their respective towns, villages or cities, and kept isolated; and when taken from the possession of their owners one-fifth (⅕) of the expense of their maintenance shall be paid by the town, village or city wherein the animal is kept and four-fifths (⅘) by the state; such isolation to continue as long as the existence of such disease or other circumstances may render it necessary.

Section 2. The said local boards of health, when any such animal is adjudged by a veterinary surgeon or physician, by them selected, to be infected with any contagious or infectious disease, may, in their discretion, order such diseased animal to be forthwith killed and buried at the expense of such town, village or city.

Section 3. The said local boards of health, may cause all such animals that have been within the state for six (6) months next preceding the adjudication mentioned in section two (2) to be appraised by three competent and disinterested men under oath, at the value thereof at the time of the appraisement, and in making such appraisement the appraisers will take into consideration the fact of the existence of such disease, and the amount of the appraisement shall be paid as provided in section one (1) except as provided in section fifteen (15) of this act.

Section 4. The said local boards of health may, within their respective towns, villages and cities, prohibit the departure of animals from any inclosure, or exclude animals therefrom.

Section 5. The said local boards of health may make regulations in writing to regulate or prohibit the passage from, to or through their respective towns, villages or cities or from place to place within the same, of any cattle or other domestic animals, and may arrest and detain, at the cost of the owners thereof, all animals found passing in violation of such regulations, and may take all necessary measures for the enforcement of such prohibition, and also for preventing the spread of any disease among the animals to their respective town village or city, and the immediate vicinity thereof.

Such regulations shall be recorded upon the records of their respective towns, villages and cities, and shall be published in such towns,

villages and cities, in such manner as may be provided in such regulations.

Section 7. Any person disobeying the orders of said local boards of health, made in conformity with the preceding provisions, or driving or transporting any animals contrary to the regulations made, recorded and published as aforesaid, shall be punished by a fine of not less than one hundred (100) dollars, nor exceeding five hundred (500) dollars, or by imprisonment of not less than thirty (30) days, nor exceeding one (1) year.

Section 8. Whoever knows or has reason to suspect the existence of any such disease among the animals in his possession, or under his care, shall forthwith give notice thereof to the said local boards of health of the town, village or city where such animals are kept, and for failure so to do, shall be punished by a fine of not less than fifty (50) dollars nor exceeding five (5) dollars, or by imprisonment of not less than thirty (30) days nor more than one (1) year.

Section 9. Any member of any local board of health who neglect or refuse to carry into effect the preceding provisions shall be punished by a fine of not less than one hundred (100) dollars, nor more than five hundred (500) dollars for each days neglect.

Section 10. When the state board of health make and publish any regulations concerning the extirpation, care or treatment of animals infected with, or which have been exposed to, any contagious disease, such regulations shall supersede those made by the local boards of health; and said local board of health shall carry out and enforce all orders and directions of the state board of health to them directed.

Section 11. The state board of health shall have all the power and authority herein conferred upon local boards of health.

Section 12. The local boards of health within 24 hours after they have notice that any domestic animals in their respective towns, villages and cities are infected with or have been exposed to any such disease, shall give notice thereof in writing to the state board of health.

Section 13. The state board of health may make all necessary regulations for the quarantine of such animals, and extirpation of such disease, and may direct local boards of health to enforce and carry into effect all such regulations as may from time to time be made for that end; and any member of any local board of health who refuses or neglects to enforce or carry out any regulation of the State Board of Health, shall be punished by a fine of not less than one hundred ($100) dollars, nor more than five hundred ($500) dollars for every offense.

Section 14. The state board of health, when, in their judgment the public requires it, may cause to be killed and buried any domestic animals which are infected with, or have been exposed to, such disease; and except, as provided in the following section, shall cause such animals to be appraised in the manner provided above, and the appraised

value of such animals shall be paid, one-fifth (⅕) by the town, village or city in which such animals were kept and the remainder by the state.

Section 15. In all cases of farcy or glanders, the state board of health, having condemned the animal infected therewith, shall cause such animal to be killed, without an appraisement or compensation to the owner thereof, but may pay the owner an equitable sum for the killing and burial thereof.

Section 16. Any person who fails to comply with the regulations made or an order given by the state board of health, shall be punished by fine not exceeding five hundred ($500) dollars or by imprisonment not exceeding one (1) year.

Section 17. All appraisements made shall be in writing and signed by the appraiser and certified by the local boards of health or state board of health respectively, to the governor and to the treasurer of the several towns, villages and cities wherein the cattle appraised were kept.

Section 18. The state board of health may examine, under oath, all persons believed to possess knowledge of material facts concerning the existence or dissemination or danger of dissemination of disease among domestic animals; and for this purpose shall have all the power vested in justices of the peace to take depositions and to compel witnesses to attend and testify. All costs and expenses incurred in producing the attendance of such witnesses shall be certified by the state board of health and paid from the treasury of the state upon being certified to and approved by the governor.

Section 19. Whenever animals are exposed to contagious diseases or killed by an order of the state board of health, and upon a post mortem examination are found to have been entirely free from disease, the state board of health shall cause the same to be sold under their direction, first giving to the purchaser notice of the facts, and if said purchaser or any other person shall sell said slaughtered animals or any part thereof, he shall in like manner give notice to the parties to whom such sales are made, and the proceeds of the sales, made by order of the state board of health, shall be applied in payment of the appraised value of such animals.

Section 20. Whoever violates any of the provisions of the preceding section shall be punished by fine not exceeding one hundred (100) dollars and the cost of prosecution.

Section 21. The state board of health shall keep a full record of their doings and report the same to the legislature unless sooner required by the Governor.

Section 22. The state board of health may, by order require any two or more local boards to act together for the purposes of this act.

Section 23. The sum of three thousand (3000) dollars or so much thereof as is necessary is hereby annually appropriated for the payment

of expenses incurred by the state in enforcing this act; said expenses to be approved by the state board of health and by the governor.

Section 24. This act shall take effect and be in force from and after its passage.

Approved March 7, 1885.

New Hampshire.

Dr. Irving A. Watson, secretary of the state board of health writes: "In reply to your favor just received, I would say that our laws relating to contagious and infectious diseases among domestic animals are very imperfect and rudimentary. The board of cattle commissioners, of which I am a member, have authority to act in such cases as shall seem to them best for the public good excepting that the board has no authority to destroy diseased animals. In regard to glanders, we isolate the cases if the owner will not consent to have the animal killed. There is a fine of $50 for allowing a glandered horse upon the highway or in a pasture.

CHAPTER CCXXV.

An act concerning contagious and infectious diseases among animals, and to repeal certain acts relating thereto.

1. Be it enacted by the Senate and General Assembly of the State of New Jersey, That in case any contagious or infectious disease shall appear or be suspected to exist in any locality in this state, it shall be the duty of all persons owning or having any interest in animals infected or supposed to be infected, and of any person having knowledge or suspicion thereof, at once notify the state board of health or some officer or member of said board, of the facts and it shall be the duty of said board, upon receivnig such information or any information in regard thereto, to investigate the same, or cause the same to be investigated and if any such disease is found to exist or likely to break out to quarantine such animals, and to take such precautionery measures in relation to other animals exposed to such disease as shall be deemed necessary, and to enforce such regulations in relation to such diseases as the said board may adopt.

2. And be it enacted, That whenever in the judgment of the said board its agents or appointees, it shall appear that such disease is not likely to yield to medical treatment, or at the expense of such treatment will be greater than the value of the animal or animals infected; and when in any case such disease is likely, in the judmgent of said board, its agents or appointees, to be communicated to other animals, they shall cause the animals infected to be immediately slaughtered, there remains to be buried at least four feet beneath the surface of the ground, and and all places in which the same have been kept to be thoroughly cleansed and disinfected.

3. And be it enacted, That any animal or animals shall be slaughtered as directed in the preceding section, the value of the same may, at the request of said board or any person interested, be ascertained and appraised by three disinterested free holders, resident in this state, who shall make and sign a certificate thereof, in the presence of a witness who shall attest the same; such appraisement shall be made on the basis of the market value of the animal or animals slaughtered just prior to the time when they became so diseased, and shall be limited to the sum of one hundred dollars for registered animals and to forty dollars for all others; one half of the valuation so ascertained shall be paid by the state on the presentation of such certificate, with the approval of the said board endorsed thereon, to the owner or owners.

4. And be it enacted, That when any herd or portion thereof has been or is so exposed to any contagious or infectious disease, and the state board of health deem the disease likely to spread to that portion of the herd still unaffected, although isolated or quarantined, said herd may, with the consent of the owner or owners and with the restrictions agreed upon between them and the executive officer of the state board of health, cause or allow said herd or herds to be inoculated for the prevention of such diseases as can be thus mitigated; but any loss resulting from such inoculations shall not constitute any claim against the state, or the board of health; provided, that inoculation for pleuro-pneumonia shall in no case be allowed without the consent and approval of the state board of health, and shall be measured under its direction.

5. And be it enacted, That when city, township or district shall be threatened with any contagious or infectious disease among animals, to such an extent as to seem to require more general precautions, the state board of health, shall notify the local board of health, and, with the advice and consent of the local board of health, may for a time prohibit the bringing of any cattle into such city, township or district without inspection and a written permission, and may prohibit the running at large of animals in any township, if not already prohibited by law, for such time as the township board of health shall advise; and the state board of health may call upon local boards of health to discover and report cases of contagious disease and aid in measures for its abatement and prevention.

6. And be it enacted, That when any animal or herd of animals is held in quarantine under authority given by the laws of this state to the state board of health, it shall not be lawful for the owner or keeper thereof to add any animal to such herd, by purchase or otherwise, without the written consent of said board under penalty of being adjudged guilty of a misdemeanor and fined therefor to an amount not exceeding one hundred dollars.

7. And be it enacted, That any person or persons refusing or neglecting to notify said board of health, or any of the existence of pleuro-

pneumonia, rinder pest, or any other contagious or infectious disease among animals, shall be deemed and adjudged guilty of a misdemeanor, and upon conviction shall be punished by a fine of not more than $200, or by imprisonment not exceeding one year, or both, at the discretion of the court; and that if any person or persons shall knowingly buy or sell or cause to be bought or sold any animal or animals affected with the pleuro-pneumonia, rinder pest, or any other contagious or infectious diseases, or that has been exposed to a contagious or infectious disease, or is a part of any herd or stock held in quarantine, all such person or persons shall be deemed and adjudged guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding $200, or imprisonment not exceeding one year or both at the discretion of the court.

8. And be it enacted, That when, by reason of the locality of an infected animal or herd within a city, or by reason of frozen ground or extreme heat, it is in the judgment of the state board of health, or those acting under its authority, inexpedient or impossible to bury any such dead or slaughtered animals on the premises, the board may authorize any veterinarian acting for said board to slash the skin and cut the flesh of the same, and, either under his direct oversight or that of the city board of health or contractor for the disposal of dead carcasses, to give over the same to the use of a bone boiling or glue or other establishment for the disposal of dead animals, but in no case shall the same or any part thereof, be disposed of for food, and any such disposal of the same, shall make the party or parties concerned, guilty of a misdemeanor and punishable by fine not to exceed one hundred dollars, or imprisonment in the county jail for a period not exceeding six months.

9. And be it enacted, That if, between the first day of October and the first day of May of any year, a veterinarian who has been regularly graduated in veterinary medicine, desires to make a post-mortem examination of any animal he has attended, or at the request of the owner of any animal that has died within the city limits, he may do so, if such examination is made within 24 hours of the death or slaughter of said animal; in every such case he shall notify the city scavenger, or remover of carcasses of animals, of the hour of his examination, and said scavenger shall arrange to remove the carcass in not more than three hours after the said examination.

10. And be it enacted, That it will be the duty of the state board of health to keep a full and complete record of all the proceedings under this act and report the same annually to the state board of agriculture, and such report shall be printed in and form a part of the annual report of said board of agriculture.

11. And be it enacted, That the sum of $2000 is hereby annually appropriated to the state board of health, to defray the expenses of the said board in the duties imposed by this act, and that the governor,

secretary of state and the comptroller be, and they are, hereby authorized to determine what sum annually shall be allowed to said board or any member thereof for services in the oversight and execution of the duties hereby imposed, but the amount allowed shall not exceed the sum of $500 in any one year.

12. And be it enacted, That if, on account of the prevalence of any contagious disease of animals or the necessary guarding against the same, any greater expenditure shall seem to be required, the state board of health shall present the facts to the governor, the secretary of state and the comptroller, who shall authorize such additional amount as they may think necessary but in no case shall the yearly amount thus authorized to be expended exceed $5000.

13. And be it enacted, That all bills for money expended under this act shall be audited by the comptroller of this state, and then submitted to the governor for his approval, and after being thus audited and approved by the governor, shall be paid by the state treasurer upon warrant of the comptroller.

14. And be it enacted, That the following act, to wit: (1) A supplement to an act entitled "An act to establish a state board of health," approved March 9th, one thousand eight hundred and seventy-seven, which act was approved on the 12th day of March, one thousand eight hundred and eighty; (2) A further supplement to an act entitled "A supplement to an act entitled 'An act to establish a state board of health," approved March 9th, one thousand eight hundred and seventy-seven, which supplement was approved March 12th, one thousand eight hundred and eighty, which further supplement was approved on the twenty-third day of March, one thousand eight hundred and eighty-one; (3) A supplement to an act, entitled "An act to establish a state board of health," Approved March 9th, one thousand eight hundred and seventy-seven, which supplement was approved March 12th, one thousand eight hundred and eighty, and also a supplement to the further supplement of said Act, approved March 23d, one thousand eight hundred and eighty-one, which supplement was approved March 17th, one thousand eight hundred and eighty-two; (4) supplement to an act entitled "An act to establish a board of health," approved March 9th, one thousand eight hundred and seventy-seven, and to supplements thereto relating to the contagious diseases of animals, which supplement was approved March 22d, one thousand eight hundred and eighty-three, and all other acts and parts of acts inconsistent with the provisions thereof, be and the same are repealed, but any rights acquired under the said acts or either of them, and any suits pending under the same, shall not be affected by the repeal.

15. And be it enacted, That this act shall take effect immediately.

Approved May 4, 1886.

Rules and Regulations of the State Board of Health of New York for the destruction of animals affected with glanders.

CHAPTER 53.

An act to provide for the destruction of animals affected with the disease known as glanders. Approved by the Governor, March 14, 1888. Passed, three-fifths being present.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. It shall be the duty of the local boards of health in this state to destroy, or cause to be destroyed, all animals found within their jurisdiction affected with the disease called glanders. The proceedings of said boards of health under this act shall be controlled and directed by such rules and regulations as the state board of health shall from time to time prescribe.

2. This Act shall take effect immediately.

WHEREAS, by chapter fifty-three of the laws of 1888, local boards of health in this state are required to destroy animals found with the glanders within their jurisdiction, and the proceedings of said local boards in reference thereto, are to be controlled and directed by such rules and regulations as the state board of health shall prescribe.

Now, therefore, the said state board of health by virtue of the power vested in it, has prescribed the following rules and regulations to be observed by said local boards of health in carrying out the provisions of said chapter fifty-three of the laws of 1888, to wit:

1. A local board of health being notified of the existence of said disease, glanders, must take proper means to determine the nature of the disease by employing a competent veterinary surgeon or other person or persons who, in their judgment, are competent to pronounce upon the nature of the suspected disease.

2. Upon the written certification of said veterinary or other person or persons thus employed, said local board of health shall kill or cause to be killed, any animal or animals having the glanders, and shall cause the carcasses of all animals so killed to be disinfected and buried forthwith, at least three feet below the surface of the ground, and shall further cause all stalls, stables, barns, sheds, halters, harnesses, blankets, buckets, measures, mangers, racks or other places or utensils which may have been exposed to the contagion of said disease, to be thoroughly disinfected and cleaned.

3. Local boards of health are hereby cautioned against too hasty judgment, and advised to use every precaution to insure a correct determination as to the nature of the disease. A record of all proceedings should be placed in writing and filed in the office of the board of health.

4. Local boards must report all action taken under chapter fifty-three, Laws of 1888, to the state board of health.

The CHAIRMAN. Remarks upon the paper are now in order.

Dr. FOWLER. I did not have the pleasure of hearing the first part of that paper, but only the last few remarks the gentleman made. I think there is a state law at the present time in regard to glanders in horses, a criminal act at the present day; and in addition to that they are liable for whatever stock is contaminated with the disease.

Dr. MCINTIRE. I would be very happy to read the law if any person would like to hear it. It is an act passed in the last legislature entitled, "An act to prevent the spreading of contagious diseases among animals." I am quite positive that there is no previous law, for the reason that I ran against this snag myself, and we had to call into requisition the Attorney General, the Governor, the State Board of Health, and the State Board of Agriculture, and then, by an amicable agreement, the matter was compromised; so that we have the Attorney General's opinion that there was not any law previous to that passed by the last legislature.

(Act of Legislature of 1889 read.)

Such sir, is the act passed by the last legislature. It does not specify glanders but it is clearly included in the words, "not otherwise provided by law."

The CHAIRMAN. The next paper on the list is the Hygiene of Public Institutions, by Selden H. Talcott.

Dr. LEE. Mr. Chairman, Dr. Talcott is not present; he has sent his paper and I would move that the paper be read by title; it is here and can be read after other papers have been read by gentlemen who are present. I think it is fair that those who are present should have the precedence and I therefore suggest that this paper be simply read by title.

The motion was duly seconded and carried.

The CHAIRMAN. The next paper is the Ventilation of School Building by Chancellor Goff.

Dr. MCCLELLAND. As Chancellor Goff is not here, (he was here this morning prepared with his paper) I would move that his paper be accepted by title and referred to the Board for publication.

This motion being duly seconded was unanimously carried.

The CHAIRMAN. The next paper is on School Hygiene, by Bushrod W. James, M. D., of Philadelphia.

Dr. MCCLELLAND. I also have to report that Dr. James telegraphs that he is unable to reach the city, and I therefore move that his paper be disposed of by being read by title and referred for publication.

Motion seconded and carried.

The CHAIRMAN. The next paper is the Surburban Home, by Dr. George G. Groff.

(Paper read.)

Dr. PEMBERTON DUDLEY. In order that you may understand about President Groff's avoidance of the use of an air conduit in his cellar, I

hope Secretary Lee will tell us something about the situation of Dr. Groff's house, and the cellars and cess pools, and so on surrounding his house. Dr. Lee has been there and knows all about it.

Dr. LEE. I am at a loss to understand, I must say, why my friend Dr. Dudley does not give you this information himself; he is quite as able to do it as I am.

The house to which he has referred, however, is most delightfully situated on an elevation overlooking a beautiful stream; the soil is gravelly, it is admirably drained, there are comparatively few trees near the house: it has an abundance of sunlight and the cellar itself is a model of what a cellar ought to be. I don't know that I can say more than that.

Dr. DUDLEY. How many houses are there around it and how many cess pools?

Dr. LEE. The nearest house is the University, which is, I suppose, a half or a quarter of a mile distant; and I saw nothing whatever in the way of a cess pool in the neighborhood.

Dr. DUDLEY. If I had a house like that I wouldn't be afraid to do without an air conduit either.

Dr. GROFF. I would say to Dr. Dudley that the typical surburban home should be on a large hill; the lot of ground and the house should be as large as the means of the occupier would permit. I would have my neighbor so far away that the ground air and cess pools would not be troublesome.

The CHAIRMAN. (Mr. Willliam A. Herron in the chair) The next paper is Some Effects of Over indulgence in Animal Food, by Dr. J. C. Dunn.

Dr. DUNN. Mr. President, the hour is getting late, a good many papers have been read by title and I would have no objection to having mine read in the same way. I am down on the programme to read a paper on Some Effects of Over Indulgence in Animal Food. I would ask leave to change the title of the paper because I hardly think I am responsible for that. A short time ago the worthy secretary of this board finding that the programme was not altogether full, telegraphed Crosby Gray, who has learned, as he says, to obey orders, something like this, "Crosby get your gun," and he brought it to bear on me for a title for a paper to be read before the meeting. The title was all he wanted.

I ask leave to change the title, and I would say now my paper is yet incomplete, and if you would rather have it read by title I am perfectly willing to do so.

Dr. MCCLELLAND. I would suggest you give us some of the points?

Dr. DUNN. The title of the paper is the Consideration of Food in regard to Age and Work.

(Paper read)

The CHAIRMAN. The next paper is the Metal Worker's Occupation, by Dr. Pemberton Dudley, of Philadelphia.

Dr. DUDLEY. I am about to make a request in regard to my paper. It does not contain a thought that is not familiar to the medical people and as there are no lay people present I move that it simply be read by title.

This motion was duly seconded and carried.

29.—THE METAL WORKER'S OCCUPATION AND HIS HEALTH.

By PEMBERTON DUDLEY, M. D., *Philadelphia, Pa.*

The influence of occupation upon health forms a theme of earnest study to the sanitarian and the political economist, and forces itself upon the attention of the physcian at every turn. That certain vocations are in their nature or else through their surroundings inimcal to the health of those engaged therein, has come to be universally admitted. That certain other vocations are as certainly conducive to robust and vigorous health is not less generally understood. And yet we have only partially learned the lessons recorded in the general mortality rate, the average longevity and the prevalent diseases of the people engaged in this or that particular line of business industry. Only in recent years are we noting particularly the essential and accessory conditions and circumstances under which we carry on our daily work, with a view to learn how best to mitigate those that are unfavorable, and to promote those that are beneficial. And let me say here, in passing, that so long as we are deprived of the facilities for accumulating and preserving statistics relating to these subjects, so long shall we make but indifferent progress in our investigations, and we shall go on in our present course, sacrificing the lives of our people, through an ignorance born to a false economy—an economy which "withholdeth more than is meet, and yet tendeth to poverty."

And so, while there is no occupation about which we have acquired complete sanitary knowledge, there are at least a few about which we have certain demonstrated facts that ought to be forcibly impressed upon the minds of our people, and especially upon the attention of employers and of persons seeking an occupation or profession for their growing children. It is the aim of this paper to present a few of the more prominent facts relating to one comprehensive department of the industries of our great Commonwealth, so far as these facts are known to affect the health of our people. I allude to our vast and diversified industries in the extraction of metals and the process of their manufacture.

From observation of the steps required in securing the metallic ore, and conducting it through all its changes to the finished condition

ready for the market, it seems that there is not a single stage at which the health of the workman is not exposed to some peculiar perils. Some of these dangers are well-nigh unavoidable, others appear to have been diminished by careful attention to principles developed by advancing knowledge, and a few, at least in some branches of the metal industry seem to have been reduced to a minimum. That further knowledge will give us yet increased control of the conditions unfavorable to our workmen can scarcely be doubted.

Remembering the various modes in which health is affected by occupation, and applying our knowledge to the occupations under consideration, we find connected with these vocations, at least the following causes of impaired health: constrained attitudes, and long-continued postures; intense or continuous muscular effort; violent muscular contraction, suspending respiration, or impeding the heart's action, or interfering with the digestive function; heart-strain, followed by dilatation, with or without subsequent hypertrophy and its chain of consequent dangers; too long hours of exhausting labor; irregular hours of sleep; exposure to intense heat, or to sudden or frequent changes of extreme temperature; exposure to frequent wettings; exposure to dangerous gases, or to dangerous artificial vapors, constrained or prolonged use of the eyes under insufficient light; prolonged exposure of the eyes to intense light or heat, or to the glitter of highly polished surfaces, inalation of metallic and mineral dust, etc. And as already said, some one or more of these perils confront the workman at every step—in mining, lifting, hauling, smelting, refining, moulding, forging, rolling, cutting, turning, grinding, polishing—each of them has its own conditions of labor, its own perils and its own list of victims.

In regard to a portion of the untoward influences above mentioned, the public are already suspicious. The dangers likely to follow exposure to wetting or to extreme cold or to frequent changes of atmospheric temperature are understood sufficiently well to make thoughtful people cautious, and if our mining population should be disposed to make light of these dangers, their prevalent pneumonias, their asthmas, and their rheumatisms serve as constant reminders of ever-present perils. So too the danger of respiring subterranean gases, or even the products of combustion and respiration are well understood, spite of our crude notions as to the means for avoiding them. Something is also understood of the dangers attending muscular strain, though its effect upon heart, lungs and stomach may be only partially suspected by our workmen and their employers

There is one point, however, upon which it may be said, that the knowledge possessed by physicians and other sanitarians is not properly shared by the general public, and that is the hazard involved in the inhalation of dust, and especially of metallic and mineral dust.

People have so industriously read and imbibed the advertisements of patent cough-mixtures, and have so universally associated the cough of a consumption with the cough of a laryngeal, tracheal or bronchial catarrh, as to have reached the conclusion that to avoid consumption, one need only avoid "taking cold." Our people need to be carefully instructed in two particulars: *first*, that a cough can be produced in numerous ways other than by "taking cold," and, *second*, that, in all probability, a majority of the cases of lung-consumption do not originate in a "cold" at all, but in quite a variety of other ways; the "cold," as it is called, having been but a secondary factor in developing and intensifying a process which had its beginning months or years previously. It will be somewhat difficult, however, to convince the masses of the truth and importance of these statements so long as they continue to obtain their medical lore from quack advertisements in the newspapers.

In the causation of pulmonary consumption, there are few things more definitely established than the baneful influence of mineral dust. In persons continuously exposed to an atmosphere more or less charged with the gritty particles of metallic or other mineral bodies, and who constantly take these particles into contact with the lining of the air-cells and tubes, the liability to, and probability of subsequent phthisis are increased to a surprising degree. Abundant evidence has been found to show that particles of silex, iron oxide and other substances penetrate the walls of the air-cells and minute bronchial tubes, developing irritation, inducing indurations, the formation of nodules and the deposit of tubercle, these masses finally exhibiting the degenerative changes common in phthisis arising by other modes.

The extent to which these degenerative changes in lung tissue exhibit themselves in metallic and mineral dust-workers, is well shown in certain statistics to be found in our medical and sanitary text-books. The tables prepared by Hirt show that of the patients treated in the hospitals of Breslau and Würzburg, those whose occupations involved practical freedom from a dusty atmosphere, showed a proportion of phthisis cases amounting to about 8 to 18 per cent., while of those exposed to metallic and mineral dust the proportion was from 8 to 80 per cent. Among needle-polishers—I quote from Dr. Tracy—the proportion of phthisis cases to the total number of the sick reaches the astounding figure of 69.9 per cent. File cutters, lithographers, grinders and other metal workers and mineral workers, showed the effect of occupation in a scarcely less remarkable degree. The reliable observers have agreed in statements indicating that the needle polishers of Derbyshire, at least in former times, rarely reached the close of their thirty fifth year. They died of phthisis.

Two important facts of a practical nature remain to be mentioned. One is that the conditions under which operatives labor are amenable

to improvement under the influence of progressive science and invention. Thus it is said that of late years the trade of the needle polisher from being one of the most dangerous of vocations, has become one of the safest—a change due entirely to improved methods. Another is, that according to the views of our best medical authorities, the lung disease which springs from the inhalation of gritty dust and independently of predisposition, is not hereditary, and moreover may often be arrested, and health restored by an abandonment of the dangerous occupation.

The CHAIRMAN. The next paper is, "Some of the Advantages of Modern City Buildings with special reference to the Respiratory Organs," by Dr. W. T. English, of Pittsburgh.

Dr ENGLISH. Mr. Chairman, with your permission, and the permission of this Board, I will submit my paper by title.

30—SOME OF THE HYGIENIC ADVANTAGES OF MODERN CITY BUILDING WITH SPECIAL REFERENCE TO THE RESPIRATORY ORGANS.

By W. T. ENGLISH, M. D., *Professor of Physical Diagnosis, Western Pennsylvania Medical College.*

Three of the most important factors contributing to the maintenance of life are: air, water and food. Their relative importance to existence may be illustrated by the estimate, that life may continue three weeks without food: three days without water; and only three minutes without air. The respiratory cycle is completed every three or four seconds, and the inspired air is expelled from the lungs. Notwithstanding this rapid removal of the air it is constantly in communication with the blood. In preserving the health of the individual, no more important auxiliary can be called to our aid than pure air. In crowded cities, where the oxygen consumption is rapid, and the contaminations in their extremity the question for the sanitation to ponder over is, "How shall we secure the maximum purity, with the minimum oxygen waste?" The question becomes momentous when we realize that one-fourth of the inhabitants of the world live amid the city environments. The majority of this portion of the population are so involved in the struggle against threatening squalor, or the greed for gain, that they neglect or ignore the more common hygienic laws, and by such disregard contribute to the contaminations. Obviously, other difficulties arise. Filth and rottenness are not distresses to some people, because they are part and parcel of their heritage. From birth they have known nothing better. It is where decency and cleanliness are elevated into the necessities of existence, that men are taught loathing for foul air, and are

emulous of bright surroundings. The highest appreciation for cleanliness and pure air is secured through the experience of its benefits. City life does not afford this experience to any advanced degree. A certain amount of impurity is co-existent with city life. It may seem pessimistic to say that evils exist in the city which are unchangeable; but it is not worse than an acknowledgement that for some diseases there are no known remedies.

It may be of interest, however, to us and of profit to all, to consider if in modern city building there has not been progress toward a higher sanitary plane. It will appear in a comforting degree to the advantage of those who assiduously labor in behalf of their thoughtless and indifferent, if not vicious fellowmen, if it can be proven that their efforts are fruitful of gain, and that the palliations introduced are of practical utility. The sanitarian accomplishes much through ways and means that are remote, and for which he never receives recognition. It is a hard fact, nevertheless, that in hygienic progression in modern city building the sanitarian is the principal factor. The knowledge and observations are his, and by his approval or condemnation the evolution begins which ultimates in making the proper thing the popular thing. It may be in the thronged street or in the quiet of the laboratory that he succeeds in linking fact with thought, but somehow the idea spreads like contagion. In considering some of the advantages of modern city building, with special reference to the respiratory organs, I shall bear in mind the remote as well as immediate influences of the sanitarian.

Upon the heels of hygienic discipline and in direct consequence of the spread of sanitary knowledge, are following invention and utilization of means, by which the air is preserved in more primitive purity, the respiratory organs protected against direct injury and disease, while the cure of those already ill is facilitated. A casual view of our streets, alleys and courts will reveal the fact that there is advance in street paving. This is apparent upon our principal thoroughfares in the substitution of the Belgian block for the cobble-stone pavement. Upon the alleys and courts we observe the smoother surface of the concrete or asphalt. The cobble-stone pavement with its myriad crevices for accumulation of offal, excreta of animals, and filth generally is giving place to the Belgian block and asphalt. First, because of hygienic considerations, and second on account of economic profit; which may be denominated as durability and saving of horse-power. Mr. Rudolph Hering says that, "The load which one horse can draw upon an asphalt pavement would require two horses upon ordinary Belgian block, and seven and four-fifths upon bad cobble-stone." But the hygienic considerations appear in the facts, that the more regular and even surfaces of the Belgian block and asphalt, favor the spontaneous displacement of the accumulations; makes them more obvious to the street cleaner,

and renders their removal easier of accomplishment. Thus the air contamination is reduced, the dust of dry weather decreased, spontaneous washing by rainfall facilitated, and cleanliness generally promoted. If the efforts of the sanitarian are not visible in this, then surely it will be admitted that his sanction at least suffers it. The asphalt upon the alleys and courts is for other than economic considerations, and indeed is in the main of hygienic importance.

Extending our observations, we note that electric railways are erected and cable cars are occupying the place once supplied by horse cars. It is estimated that the cable lines in this city employ engines, the aggregate power of which as compared to horses is equivalent to 150 horse-power. The electric roads are claiming greater potency. About two thousand now used and the roads under contract and building will double the power at least, in those in course of erection. In all they give the formidable figures representing 4000 horses. These estimates become portentious, when we consider the removal of this vast army of animals from the streets in relation to its effect upon the cleanliness and hygiene of the city. The absence of offal, incident to such a herd of animals, exhalations, effluvia, and under the most favorable circumstances the dust, gas and odors innumerable, constitute only a small part of the benefits. The horse-cars have long been considered disease-breeding, being housed up hours when not in use, amid the air of impure stables and emanations from animals,—among which from the very nature of things, were those foul with disease. The street-cars by their slower progress, longer expose the occupant to the contaminations so prevalent within, and also to possible contagion. Incidental gains are secured by the building of traction lines, in that they are compelled to protect their own cable-line by a special and careful system of sewage; in this rendering double service by decreasing the amount of sewerage and dirt, and by increasing in an inverse ratio the facilities for their removal. The celerity of travel, and the proper heating in winter are aids in protecting against exposure, and together will prompt excursions into the purer air of suburban districts. Over-crowding is less common and ventilation better secured in the capacious cable and electric cars. To pursue the subject, in the influence upon the health through the medium of the respiratory organs, we must not omit the very important fact that one horse will consume as much oxygen as four vigorous men, and contribute a proportionate amount of carbonic acid gas; and that if this vast oxygen consuming, filth contributing herd was maintained on our streets, the oxygen consumption and the exhalations of carbonic acid gas, would equal four times as many human beings as the numerical estimate of the horses or 16,000 people. The streets of every busy city will produce at certain hours as many animals as human beings or at least their equivalent in oxygen consumption, and yet we wonder sometimes why the denizens of the city suffer from oxygen waste and

atmospheric impurities. The ultimate and inevitable exclusion of this vast number of animals from our streets, seems intimated by the improvements, rendering them less necessary each decade. We have hitherto been inhaling dust, bacilli, germs, the emanations and breath of animals and our long continuance in such atmosphere has partially deprived us of the warning sense of smell. These things are passing away and by their exodus, the conditions favorable for the deposition of initial germs of disease, are reduced and the germs themselves rendered less potential and noxious. From such considerations it would seem that at least some of the conditions favorable to perfect respiratory functionation are already with us.

Another great advantage secured in modern city buildings is the decadence of the old methods of illumination. . With the disappearance of the gas and lamp light comes the electric light which, from hygienic reasons, must supersede all other methods at present known, and by its total freedom from contamination is of specific utility to the respiratory organs. No advance in any direction in modern invention has achieved to an equal degree the reduction of oxygen waste like to this subtile agent. It seems out of proportion to the dignity of the subject to treat it in a small way; but the hygienic interest can be best appreciated by so treating it. The consumption of oxygen by the street lamps might appear to the casual observer unworthy a thought. It is estimated that each fish-tail gas jet will consume as much oxygen as three or four persons. There are in Pittsburgh about 5,000 street lamps; in Allegheny almost an equal number, representing in oxygen waste that which would supply a city of 35,000 or 40,000 inhabitants. This is the most trifling estimate we can make of the oxygen destruction promoted by gas illumination. In this city there is an average of five residents to each house. It is not unreasonable to claim that two fish-tail gas burners or two lamps are required for illuminating purposes, at least one-fourth of the time. This would then represent the equivalent of one-fourth the population of the city in oxygen waste within doors. But in the numerous trades and vocations necessitating continuous night work and on cloudy or dark days, or in dingy rooms the figures will be vastly augmented. Take the composing room of one of our daily papers in which are crowded compositors—about thirty—each requiring on an average two gas jets; and we have the oxygen waste multiplied to four times what it should be. This is not an exaggerated or overdrawn picture, for in the reporters' rooms may be found the same waste. But greater still the importance when we attempt to put in figures the waste occasioned by business house illuminations; lighting of public halls; theatres, churches, club rooms and public buildings generally. These public assembly rooms employ gas jets which consume more oxygen than the occupants during their sojourn within.

There would be no apology necessary for assuming that at least a

multiple of the population is represented in the oxygen expenditure from illumination alone; without considering the vitiating contributions from imperfect combustion of the gas and poisonous emanations from lamps. The figures given above for Pittsburgh will apply to Allegheny with very slight qualification. The general results are the same in other cities and in every place. It can be safely estimated that every city wastes in oxygen at least four times as much as it properly employs.

On the other hand there is furnished by the Allegheny Light Company alone in our cities here 23,500 incandescent electric lights, and the East End Electric Light Company furnish 6,300 making a total of, nearly 30,000 incandescent lights. These are for indoor illumination. In addition the Allegheny Light Company supplies to the streets and for private illumination 525 arc burners and the East End Electric Light Company furnishes 125, a total of 650 arc lights. The 30,000 electric lights are equal in potency in illuminating qualities to the same number of gas jets and therefore represent a saving of oxygen sufficient to supply 90,000 people. Add to this the economy exhibited by the arc burners, which are of a power greatly in excess, amounting on the average to that of ten fish tail gas jets, and each would represent thirty to fifty people, or a total of about 25,000, a grand total of saving of oxygen sufficient to supply a city of 115,000 people. From so much advancement there must spring up optimistic views. The sanitarian approves electric light from good hygienic reasons.

It has been said that after tea and bread, heat is the greatest need and sublimest comfort in every home. The improvements in heating apparatus in modern city building has been a steady progression toward perfection. Natural gas as a fuel has proved a boon beyond computation to the residents of districts in which its avails may be secured. Its advent in Pittsburgh has had a salutary influence upon the inventive ingenuity by which has been secured a more perfect system of piping and plumbing than otherwise could have been achieved. To the respiratory organs it has yielded all that can be claimed for other improvements enumerated, together with varied comforts and gains which are not within the scope of this paper to discuss. The clouds of smoke which once shut out the sky yielding a visible evidence of the contaminated air, proceeding from hundred of stacks and myriads of chimneys, have been dissipated, and are substituted by an atmosphere divested of irritating ingredients, as a sequence to the employment of natural gas. As its use becomes more universal the air will be further clarified and purity assured, because of the absence of any deleterious or irritating residue consequent upon imperfect combustion of the fuel. It is smokeless, non-sulphurous, self-mining, self-propelling and therefore yields the minimum of dust, dirt and inconvenience. The coal wagons, ash carts and chimney sweeps will be unnecessary when it is universally

employed. Even now Pittsburgh is one of the clean cities. The sun shines here as elsewhere; and its vivifying influence is one of the blessings once possessed, long sacrificed, but now regained. These are some of the profits accruing to those who are permitted to enjoy the freedom of out-door life. The advantages are even more augmented for those whose vocations or infirmities compel them to remain indoors, and for those who suffer from respiratory diseases—especially consumption—these are specific benefits. By dry air and even temperature the immature expansion of the lungs will be exchanged for full inspiration. It is a well known fact among physiologists, that rarified air or air deprived of its humidity—stimulates to full and more complete respiratory acts. Full inspiration expands the lungs and life in an atmosphere which renders necessary and agreeable such perfect respiratory movements will develop the organs of respiration. The elasticity of the lung tissues will be increased; the flow of blood in the vessels of the lungs facilitated; the lymphatic flow expedited; nutrition promoted; vaporization of the secretions untrammelled; and expectoration made easy. The nervous system will in turn be exhilarated, and good health and longevity promoted. The advantages which are sought by invalids, especially by consumptives, upon high altitudes, amid dry air and constancy of temperature, may be artificially secured by the proper use of gas as fuel. The disadvantages and fatigue incident to travel will be avoided, and last but not least, the delights, the comforts, the solace of friends and society of home need not be sacrificed. The exercise to lungs resulting from the stimulating powers of dry atmosphere is very different in its cause and consequence from that rapid and labored respiration due to exertion and muscular action in other parts of the body. The former is invigorating without fatigue, and secures with the smallest exertion more complete æration of the blood with its pleasurable influence; the latter is due to determination of blood toward the heart and lungs, and a labored circulation within the lungs. Inactivity of the lungs is a prolific cause of consumption and we naturally hail with delight the advent of any agent which will directly or indirectly yield a benign influence in checking the progress of diseases which are represented on our death record by such formidable figures as are those of the lungs. Sudden change of temperature within doors is a prolific cause of disease of the respiratory organs. Wood and coal fires occasionally prove very irritating to the mucous membranes of the air passages while the sulphurous emanations and carbon unconsumed arising from coal fires may prove positively harmful. The ashes remaining will mingle with the air and be breathed into the lungs, and by direct and inherent irritating properties cause bronchial difficulties, or form foci for the introduction of various germs or the bacilli of tubercle. With natural gas for heating purposes we are enabled to maintain an even temperature amid which grow and develop, not only

the human but also the vegetable kingdom. We may live in mid-winter surrounded by flowers in all their seasonable beauty. Nature, always compensatory, repays the effort by utilizing the carbonic acid gas exhaled by the human being for the sustenance of these plants, and by the transpiration incidental to plant growth yields to the air a wholesome humidity, laden as it always is with oxygen in its nascent state—vivifying ozone. Dr. Haller, of Berlin, was the first to observe that inhalation of super-heated air was destructive to bacilli. His experiments were conducted with dry air heated to 107 degrees Fahrenheit. Krull, of Germany, employed moist heat, but dry heat was proven most aseptic and fatal to germs. And this intimates a further utilization of the avails of natural gas in baking the air of public assembly rooms, theatres, churches, and so forth, after the departure of the audience, to destroy micro-organisms and render the air aseptic, after which the temperature may be permitted to decline to its wonted place.

It has been proposed that in all cities—large and small—there should be provided a home for consumptives. This is suggested for the dual purpose of giving the invalids all the benefits of good hygiene and special treatment as well as to avoid possible contagion. A hospital erected with a view to utilizing the aseptic advantages of natural gas and electric light, would secure the application of the most approved scientific theories. When deemed advisable the rooms could be subjected to the superheating process and extended beyond the temperature of 105 degrees Fahrenheit—at which bacilli perish—and when considered opportune the patient could be advised to inhale for some time the air at the same altitude which would render the lungs aseptic. Add to the gains already mentioned, as appertaining to heating, that of lighting by electricity—when such expedient becomes necessary—and it does appear that there is within our grasp the supply of all our needs. No consumption of oxygen; no vitiating contaminations from faulty combustion; and the negative influence on the temperature by the electric light are deserving of high esteem. In 1883 the relative death-rate in Pittsburgh from consumption was nearly twelve per cent. In five years preceding1889 it never reached more than the average of 9.96 per cent. If figures are significant this meagre statement would lead us to adopt an optimistic view of future city life. But the advantages here are peculiar in some respects and some are plainly indicated in this paper In a more general way we must consider the advance in health of the modern cities. It is a noteworthy fact that in cities which have kept up their progress commensurate with the demands of increasing population, there have followed hygienic gains. In small cities the proportionate death-rate is largest. How many elements combine to achieve such results may be conjectured; but the onward march of hygiene has secured the greatest good to the greatest number. Farr's law of density which assumes that, "The nearer men live to each other,

the shorter their lives" may be reversed, by statistics of future cities. This will be accomplished only by employing all the avails of physical knowledge, as they present themselves.

This does not seem like retrograde movement upon the part of cities, at least so far as health and longevity are concerned. There are those sentimentally spiritualistic to such a degree, that they are assured the world is going to the bad, physically, morally and mentally. The facts are that men are developing into mental giants too rapidly to be appreciated; and they are learning how to live well and to live long, and amid such environments naturally gravitate toward better thought and loftier purposes; and the benign influence comes through the medium of fresh air as a promulgator of physical potentiality, as well as a means of grace. In our cities are seen the foot-steps of that beauteous creation, the thought of whom mingles with every religious hope and aspiration. Cleanliness, so closely allied to the spiritual essence, that she is next to godliness. The name and thought are consonant with very wholesome creed and more than consonant with Christian faith.

The CHAIRMAN. The next paper is Bovine Vaccination by Dr. Alexander.

Dr. ALEXANDER. I would offer this paper to be read by title but I do not think it is entirely intended for the outside audience, because my experience has shown me that there is very little known about the propagation of vaccine virus by physicians, for I am daily in receipt of letters showing great ignorance upon that subject. I have also brought some samples of vaccine, specially a bottle of the pure liquid article which comes from the heifer, which can be examined by any one that desires to do so.

31.—BOVINE VACCINATION.

By H. M. ALEXANDER, M. D.

In response to a kind invitation I appear before this convention, with a brief paper on the proper manner of conducting an establishment for the propagation of vaccine virus.

To even touch on the annoyances many physicians have experienced in the use of vaccine, the methods of sale, keeping, shipping, operation and application, would call for many times fifteen minutes, and ere the whole story would be recited, you would be tired of the reader if not of the tale.

I shall confine myself exclusively to the buildings, their sanitary arrangements and methods of propagating.

He who intends to propagate Vaccine Virus, should select high ground in the open country, not in the built up portion of the city or town. Not only the advantages of pure air and clean surroundings are

gained, but the stables can be made cool on hot summer nights, for the inoculated cattle, an all important consideration if you would avoid confluence or malignancy; of itself sufficient to exclude the crowded city stables now so frequently used, if all other considerations were laid aside.

The stables should be large with plenty of space for each heifer, unobstructed by the too common high boarded stalls; the aisles should be wide; drainage as nearly perfect as human skill can make it. The ordinary traps opening into the hay and feed apartments above, should be discarded, and ventilators reaching from the stables to a proper distance above the roofs should be used; as, not only being better to carry out the loaded gases, but to prevent their poisonous deposits being conveyed back on the provender.

These stables should be heated, but not over forty or fifty degrees Farenheit. Stoves or dry air are objectionable; being difficult to regulate so as to have an even temperature in all portions of so large a compartment. Steam is far superior.

The operating room should be fitted up with every convenience, that it may be quickly and thoroughly ventilated. The floors sloped and the drainage such that open spiggots or a hose can carry off all droppings or impurities, with the greatest promptness, All receptacles for excrements, operating in stalls, or any portion of the stabling, which I am sorry to say is so frequently done to day, are to be depreciated. The stock used consists mostly of heifers; varying in age, from four weeks to four years. Both sexes are used and there is very little if any difference either in the yield or the quality of the virus.

The calves, or those under eight months, are frequently poor feeders. The action of the disease is very irregular, due to this and many other causes, while the virus they yield is uncertain.

Those over two years are entering the tuberculous period, and besides this danger the vaccinations made with their virus has been found very often unnecessarily severe.

When possible the male animal should be excluded, as it is far more difficult to keep the parts operated upon, clear of stable debris.

You will recognize then that I would suggest the selecting of healthy heifers, from eight months to two years of age While it has been shown by careful experiment, that cattle under two years are exempt from tuberculosis, a disease very prevalent; yet it is all important that these heifers destined to furnish the virus, we are asked and often forced to introduce into our system, should be healthy, in good condition, and something be known of their history.

Many propagators buy their stock at the drover's markets, bruised by shipping, and frequently much reduced by the inhuman methods of crowding and handling cattle trains. Others purchase their cattle form the farmers in the counties round about them; while others only

rent the heifers the surrounding farmers are rearing for their future milkers, returning them after thirty days.

This last is undoubtedly the best method, for the farmer has selected the choicest before you come, and killed or sold the rejected ones. But a still greater advantage lies in the fact that in a few years the propagator finds himself in possession of the pedigree of every heifer; having used their mothers, grandmothers, great grandmothers, sisters and aunts. If there is a sick cow in the country the propagator can look it up, and avoid the offspring, or aid in getting the undesirable cow out of the neighborhood.

I know a propagator, who not a year since learned of the presence of a sick cow, went to see her, found she was suffering from consumption, and failing to convince the owner, he called on the ladies of the household and so alarmed them, they refused to use any more of her milk. Instead of killing her as should have been done, she was given to a poor huckster, whose large family used all the milk she yielded.

The same methods were used with this family to rid the neighborhood of her presence; but failing, the propagator asked for a price to be put on her, and paid it on condition that she be killed at once. The huckster realizing the fact that cities seldom object to adulterated milk, drove her to a neighboring town, and traded for a crippled mule.

I do not think I need to say more to convince you of the great advantage of this latter mode of procuring stock. Thus obtained they should be carefully brought to the establishment, placed in the stables before described, properly examined, treated to a bran mash with continued careful feeding and good grooming, they will be ready for the operating table in a very few days.

Many plans have been devised for casting and holding cattle for this operation. Some have a series of uprights that are pressed against them, holding as in a vise, while on their feet, and operating in this way. The objection is that it is difficult to work at the portions selected, and almost impossible to keep clean during the entire time of the operation. Others cast them on their side, which makes it nigh unto impossible to work with satisfaction on the inner side of the upper flank, and many cattle become much distended, commonly called bloated, and have to be removed before the operation is completed.

Still another method is to cast them into a cushioned V shaped apparatus; with the center groved out, that they may not rest directly on the spinal column, but on the broad and strong portions of the back contiguous thereto, with their feet fastened to uprights by cushioned straps. They will lie comfortably in this way for almost any length of time.

The parts generally selected are the inner sides of the thighs just back of and above the udder. The hair is all shaven off as from the face

by the tonsorial artist. Some prefer that portion of the abdomen, immediately in front of the udder; while many use both points.

The animal shaven ready for the scarifier, brings us to a much mooted question, regarding the number and size of the scarifications. Some propagators contend that the places selected should not be larger than the size of a nickel; while others make them as large as silver dollars. It must be remembered that if the operation is a success, seven days later when the animal is ready for the removal of the virus, the spots or points of selection will be fully twice their original size

Those who favor very small scarifications charge that the large ones yield a great number of ivory points, but that it is not vaccine virus, only serum; and deny that any vesicle can be made to yield a pure article in any such quantities.

Those in favor of the large scarifications reply, that they only make ten or fifteen of them, against eighty or ninety small ones; and that the animal is only yielding the same amount of virus, with the exception that they can get it all, while from a large number of small scarifications this is impossible. I think there are serious objections to both methods. The scarifications should not be originally larger than a silver quarter, and should not number over twelve to twenty, according to size and age of animal. Too large a surface with its attending inflammation, produces when the vesicles are opened, a flow that must be largely diluted with serum, and certainly contains dangerous products of this great inflammatory action. On the other hand those who adopt small scarifications and make eighty to one hundred of them, must and do use pressure to get any yield at all. Some have forceps made es pecially for this purpose with which they catch the tissues surrounding the vesicle, and apply great pressure. By this method they also start a flow of serum; get far more blood than they would otherwise, and on ivory points coated in this manner you invariably find small particles of destroyed tissue that has been sloughing off, and has finally been separated by the pressure and adhered to the ivory point, together with the serum, blood and virus.

I cannot but believe there is a happy medium. An animal is only capable of yielding a certain amount of pure vaccine lymph. If so many small scarifications, pressure must be used, and is objectionable. The extremely large ones cause too great inflammation, and the products of this inflammatory action with an admixture of serum and virus is the result. A medium sized scarification and not too many of them, will yield all the virus the animal is capable of, and it can be gotten without pressure.

To return to the operation. The animal is vaccinated in much the same way as a child. Care being taken that the lymph which has been procured from a previous animal is well scratched into the scarified portions, to insure success. She is then returned to her stall, kept on

clean straw, well fed and cared for until the seventh or eighth day. No flies or avoidable dust should be permitted in the stables.

I would not cover the parts, for should you do so, the disease is almost certain to assume a confluent form due to the heat. The areola is not marked as on the human arm. About the beginning of the sixth day a large number of pocks occupy the edge of the scarifications. These to a very considerable extent rupture; and in this manner increase the size of the vesicle. A few of these appear over the shaven portion, and go on to complete development. Nor are the crusts depressed as on the human subject. Many of them are found convex in form, and are frequently lost.

The heifer seldom has great fever; the temperature never rising more than one or two degrees; while only one in a great number will refuse to eat one meal, when the disease is at its highest point.

The time to remove the lymph can only be told by long experience, and I cannot now enter into the many details connected therewith. I want to draw your attention to the removal of the lymph, and the forms in which it is stored.

Supposing the heifer to be ready, she is again cast on the table previously described, the crusts removed, and then sponged gently to pick up any small particles of objectionable matter, as well as to remove all pus and blood. If she has been properly vaccinated, in a few moments the lymph will stand out all over the surface of the vesicle, like drops of perspiration.

Nearly all propagators coat ivory points and quills by rubbing or wiping the point or quill on the surface of the sore. I oppose this method, as I am certain this constant irritation kept up as it is for hours at a time, will render it impossible for any operator to say what he is getting or when he should cease.

The far better plan is to take a camel's hair brush, touch it to these drops, not brushing over the surface, and then place it on the points or quills, previously fixed in little racks or holders. The vesicle is not irritated more than is caused by the removal of the crust. Besides you have avoided all particles of destroyed tissue, and other objectionable matter, impossible by the other methods. When the lymph is about spent, the surfaces glaze over, ceasing to exude, and you know you have quit at the proper time.

The length of this article prevents me from saying much about the different forms in which we find vaccine sold. I shall content myself by simply naming a few of the most common forms, as the crusts, tablets, cones, quills, ivory points and lymph tubes. I should like to speak of the relative claims of these different forms, but this I cannot now do; so will ask your attention to this familiar ivory point of American origin and manufacture. Then to these, picked up by my friend Dr. M. R. Richard, while in Vienna.

They are certainly very expensively finished, and with all due respect for the European propagators, I must express the opinion that I believe they spent far more thought on the handles of these fancy vehicles of vaccine virus, than they did on the lymph itself.

In this statement I am borne out by the fact that they have to a great extent ceased to use bovine lymph, using humanized, gathered in small lymph tubes, like these samples I show you, from the arms of the children in large cities.

These gatherers called collectors, are paid by dealers so much per tube; and I am creditably informed that the slums of London, furnish the greater number.

In conclusion I cannot refrain from drawing your attention to the fact that while Europe can lay claim to the discovery of cow-pox, and to its general introduction in the medical practice in 1797, a century will not have been gone by until she looks across the sea to America for her supply.

Animal vaccination was only introduced into this country in 1870, by the late Dr. Martin. The United States Govermnent about the year 1880, recognizing the necessity for animal vaccine, as usual forgot to encourage home enterprise, and catered to Europe by placing vaccine on the free list.

But America thank God is capable of greater things than her Congress; and I have lately had the pleasure of reading a letter containing a large order addressed to an American propagator, by no less a personage than W. Faulkner, M. R. C. S., of London, England, and deputy vaccinator to the Vaccinal Institution of London, in which he says: Your vaccine is not only better than ours, but we can purchase it from you cheaper than we can propagate."

The CHAIRMAN. Are there any remarks on that paper? If not the next paper will be by Dr. McClelland.

Dr. MCCLELLAND. Mr. Chairman, I think those who have waited through the afternoon to this time have been abundantly repaid by hearing the valuable paper of Dr. Alexander.

As my paper would only take half an hour to read I have concluded that it shall take the course of some other valuable papers that have preceded it, viz., I shall read it by title and you can trust to the future publication of it for the facts which it will contain.

I will only say that this paper contains some hot shot for our beautiful suburb, the East End. It relates to the danger of suburban districts, but I have taken our own East End district and described the condition of things there in order to illustrate the dangers that beset suburban and newly improved cities. I only hope that when the paper does come to the public eye, that some of the short comings and some of the remediable objections may be done away with in our district. We cannot overcome some of the dangers but there are many of them

that are flagrant, and which should be dispensed with and abolished without the loss of a moment's time.

As I have said here, the East End of Pittsburgh may be the garden spot of the world; it is susceptible of it. It has a beautiful situation, it is susceptible of the best drainage of any city on this continent, yet the fact remains that its conditions are anything but sanitary.

With this short introduction I will just give you the divisons of the paper and you can think up the rest. It is in three parts, first, as to the streets and sewerage, second, as to the dangers that accompany and follow necessary improvements that must prevail, and third, the dangers from the present use of fertilizers—and that I think is one of the important points. The air of our district is polluted by the spreading over a large acreage of the East End of putrifying animal matter insanely done by the citizens to improve their lawns and gardens, but it in point of fact pollutes the air that we and our children are compelled to breath. It is a practice that should be abolished and that without delay.

32—DANGERS TO HEALTH IN SURBURBAN DISTRICTS.

By J. H. McCLELLAND, M. D., *Pittsburgh, Member of the State Board of Health.*

In the briefest manner and without elaboration, I propose to mention some of the dangers that beset the suburban resident, under the present order of things:

1st. As to streets and sewerage.

2d. Dangers that accompany and follow necessary improvements.

3d. As to the use of fertilizers.

Under the first head we are confronted with the prime cause and source of most of the dangers encountered by the *influx of population in advance of street and sewer facilities.*

In the well regulated and governed cities of the world, streets and sewers are laid in advance of house building, but with us, population gathers first, and not until years have passed are the ordinary and even necessary sanitary facilities furnished. What is the result? It is that sewage must accumulate somewhere, and as a matter of fact it does. To illustrate: In the finest suburb of this great city the growth of population has been phenomenal; a large territory of open country has within a few years become, we might almost say, densely populated, and with the exception of a few main thoroughfares, this district has been almost destitute of sewers, and even street pavements.

How has the sewage of this advancing population been disposed of? In some sections private sewers have been laid to the little runs that pass through this portion of the city. But we are met by the appalling fact that most of the sewage has been conducted to lower ground at some little distance from the houses, or has actually been allowed to run into the unpaved gutters of unpaved streets. Nor is this all; many

of the fine residences on the main streets, are flanked with these same unpaved streets with the same unsanitary conditions obtaining; one can imagine what the "breezy call of incense breathing morn" would be to the early traveler in these districts, that little imagination is necessary as he encounters the "incense."

Does the average surburban citizen flatter himself that he is breathing the vivifying air of the country? What a mistake? With proper sanitary conditions this might be a garden spot of the world. No city of my knowledge is more beautiful for situation or is susceptible of better or more thorough drainage, yet are we thus deficient in this very essential of civilized life. Our method of city adminstration is largely to blame but the citizens themselves have largely been at fault, by opposing the necessary improvements. On the other hand, the citizens who pay heavily for municipal government, and have some right to expect the necessary conditions to healthy homes and surroundings, which should be the supreme object of government, instead, are practically left to the mercy of disease producing surroundings.

What does it profit us if we are protected from ravages of burglars, if having these we and our families fall victims to preventable disease? There is a fearful responsibility resting somewhere. The health interests of a community should engage the highest and best efforts of government, and in municipal government, the sewer and the paved street, should precede the dwelling house.

2d. But we would not convey the impression that nothing has been done in our surburban districts, in the way of sewering and street making. In point of fact there have been prodigious strides in this direction, especially during the past two years. Miles of streets have been torn up greatly to the inconvenience of the citizens. Inconvenience however, is not the only hardship which now attends these long deferred improvements.

The soil, and wooden pavements which have been saturated with sewage these many years are unquestionably the source of unwholesome emanations which cannot fail, temporarily at least, to affect the health of the unfortunate residents. There is no help for this state of things now, but to worry through this transition period or get away from it, until the improvements have been completed.

Another source of danger in availing ourselves of sewer facilities is this, and it is a note-worthy one. In making connection with the sewer, unless particular and vigilant care is taken, there is great risk of admitting sewer gas to the dwellings. The writer has seen the grossest carelessness in this matter, and the dwelling houses on high ground are particularly liable to the ingress of sewer gas, because the pipes leading into the main sewer are nearly always empty and serve as ventilating shafts for the sewers. Traps and ventilating pipes should be most carefully provided for all houses on high ground.

A word of caution is here added to those building upon low or filled in ground, to make sure that the ground in which their cellars are located has not suffered by previous deposits of sewage. At any rate cellars should always be hermetically sealed, and no pipe of any kind should be permitted under a cellar floor.

3d. I will only call attention in this hastily prepared note to one other matter, which I am satisfied is an unsanitary procedure.

It is the practice of spreading quantities of manure over a large acreage of lawns and suburban gardens.

It will go without saying that manure is of little value unless decomposition is well advanced. It is therefore not easily to be supposed that the effluvia arising from this putrescent animal matter is in any way wholesome. No one at any rate will boldly assert that these emanations are a desirable addition to the pure country air, in which ourselves and our families are supposed to revel. I take the ground unqualifiedly that this is unsanitary, unwholesome and altogether bad.

In the first place, it is a great waste of good material, to put this material upon the surface of a lawn; the best portion going into the atmosphere to be drawn into people's lungs, instead of turning it into the earth where it would be of great value.

In the second place, fertilization can be very much more effectually and harmlessly accomplished, by using prepared phosphates and other similar prepared fertilizers.

Let therefore the practice of polluting the air we breathe, in the interest of our lawns and gardens be forever abolished in the interest of health.

The CHAIRMAN. Are there any remarks on that paper?

Dr. FLOWER. I regret for my part that that paper was not read this evening owing to the lateness of the hour. I know the great importance of some person stirring that question up, and I do not know any person who has had more experience in practice among the East End than our townsman Dr. McClelland, but I suppose we will have to be satisfied by reading it in the journal.

The CHAIRMAN. This finishes the regular business of the convention.

Dr. LEE. I would like to offer the following resolution:

Resolved, That the thanks of this convention are due, and are hereby extended, to the Bureau of Health of Pittsburgh for its courtesy in sending officers to be present during its sessions.

This motion was seconded by Dr. McClelland and being put was unanimously carried.

Dr. LEE. I would also offer the following resolution:

Resolved, That the thanks of this convention be extended to Mr. William Metcalf, Mr. William A. Herron, Chancellor M. B. Goff and the Hon. Charles Moore, for their kind services in presiding over this convention.

This motion being duly seconded was put by Dr. McClelland and was unanimously carried.

Dr. DUDLEY. Before we adjourn may I ask that attention be directed to the eminently sanitary method of artificially lighting this hall. I think it is by all odds the best lighted room of the kind that I ever saw. There are no deep dark shades anywhere into which the observer must strain his eyes, and there are no bright glares to strike directly into the eyes. It is to me an admirably lighted hall so far as relates to the care of the eyes.

Dr. MCCLELAND. I would like to offer another resolution, which I know will meet with your approval, and that is,

Resolved, That the sanitary convention offer their acknowledgements to the city press of Pittsburgh and the press of Philadelphia for their kind attentions toward this convention.

This motion being duly seconded was carried unanimously.

The CHAIRMAN. Is there any other business Mr. Secretary?

Dr. LEE. No, sir. I move we adjourn.

This motion being seconded by Dr. McClelland was unanimously carried, whereupon the chairman declaired the convention adjourned.

The following papers were prepared for the conference, but owing to the Johnstown calamity were not read.

34—THE KING'S EVIL.

By Dr. GEORGE H. ROHE, *Professor of Obstetrics and Hygiene in the College of Physicians and Sergeons, Baltimore: Member of the Société Francaise d' Hygiène.*

Scrofula is one of the step-children of modern medical literature. So scanty are the references to it in the medical writings of the last twenty-five years that one might be led to include it, with plague and the sweating sickness, among the diseases that have disapeared from the civilized world. While doubtless less frequent than formerly (Macauley says that King Charles the Second "touched" nearly a hundred thousand persons for scrofula during his reign) it is by no means an extinct disease. No physician can practice his profession long without being freuqently brought face to face with individuals in whom the scrofulous taint is an active factor in the production of serious and often fatal disease. Whether obscure or openly manifest, its signs and symptoms are sources of grave apprehension to the wise family doctor, or to the observant surgeon.

"Scrofula," says Professor Hirsch, the great authority on the history and geographical distribution of diseases, "extends over the entire inhabited globe." No country is entirely exempt from its ravages. It is more frequent in large cities, but it also prevails in the open country. In deep valleys, over broad plains, and on the summits of high mountains it shows itself with greater or less severity. In an orphan asylum

in Lisbon every third child was scrofulous. In Berlin over one-half, and in Munich two-thirds of the orphans in the asylum are reported to present evidences of scrofula. In certain departments of France the rejections on account of unfitness for military service due to scrofula amount to three per cent. In Italy, Germany, Austria and Great Britain it is one of the most common diseases. In a comparatively recent report from the Shetland islands, scrofula is said to be domesticated in nearly every family. New Zealand, Tahiti and the Sandwich islands have been frightfully ravaged by the disease. From China, Japan and the East Indies all observers report it as extensively prevalent and extremely fatal, especially in children.

In this country, reports of the prevalence of scrofula are not very frequent, but the late distinguished Dr. Samuel D. Gross often expressed the opinion that the disease is very wide spread, and that the taint runs through several generations, frequently uprooting entire families. Even so far north as Alaska, the scrofulous diathesis is very prevalent among the natives and half-breeds.

Among the causes of scrofula, inheritance takes a leading place. All authors refer to this, and it must be within the personal knowledge of every observant physician that in certain families several members present evidences of this permeating constitutional taint.

While it is certain that the scrofulous constitution is inherited in the large majority of cases, there can be no question that the disease may also be acquired in the absence of any hereditary taint in the individual. Poverty and its accompaniments; insufficient food and clothing, over-crowding in living, school, or sleeping rooms may lead to the development of scrofula in children previously in good health, and the offspring of healthy parents.

Scrofula is a disease of youth. It generally makes its first appearance between the ages of three and fifteen years, although it sometimes does not appear until adolescence, or advanced life. Under two years of age it is rare: when it does occur in extreme youth, it generally manifests itself in eruptive diseases of the skin.

There is a popular belief that scrofula is more frequent in those of fair complexion. But no distinct relation exists between the complexion and the prevalence of scrofula. In a population in which blondes are in a majority the greater number of the scrofulous will be found among the fair haired. On the other hand, where brunettes are the leading type, these will furnish the larger proportion of those attacked. In this country the colored race is especially prone to all forms of scrofulous disease, and furnishes by far the largest number of scrofulous patients. By "colored," of course individuals of mixed blood are meant as the pure African has become rare even in the far South.

Although scrofula finds the most favorable conditions for its development among the poorer classes, the children of the wealthy are by no

means exempt. In the former, however, the bad effects of the inherited taint are much intensified by the insanitary surroundings amidst which these patients live. Hence, the severer forms of scrofulous disease, such as glandular suppurations and affections of the bones and joints are usually found among the poor.

In persons of the strumous diathesis, very slight exciting causes may determine an outbreak. The various manifestations of the disease frequently appear as sequellæ of scarlet fever, diphtheria, whooping cough, or measles. Vaccination also sometimes, though rarely, causes extensive inflammations of the skin, and glandular swellings and abscesses in children who inherit a scrofulous constitution, but in whom no manifestations of the disease have yet appeared. Vaccination however, cannot produce scrofula in an individual who is not predisposed to the disease, or in whom there is no inherited predisposition. In enumerating the causes of acquired scrofula in young children, especial emphasis must be laid upon the use of artificial foods to the exclusion of the natural food of the infant,—the mother's milk. The pernicious habit of dosing babies with anodynes, carminatives and so-called "soothing" syrups, is also doubtless responsible for the appearance of scrofula later in life.

The close relationship between scrofula and consumption of the lungs has long been recognized. Consumptive parents often beget scrofulous children, and the latter may afterward become tuberculous. In fact, the gravest danger that threatens most scrofulus patients is that their disease may terminate in consumption. Some pathologists, especially among recent writers, go so far as to make no distinction between scrofulous and tuberculous processes, and ignore scrofula altogether. Strong support has been given to this school by the discovery of the bacillus of tubercle in many of the local products of inflammation in scrofulous subjects.

Notwithstanding this, there is good reason to believe that the essential nature of the two morbid processes is different, and while scrofulous patients may, and often do become tuberculous, the latter termination is happily far from being the invariable one. The presence of the tubercle bacillus in a scrofulous gland or joint does not necessarily indicate that the patient so affected is tuberculous, or will die of consumption.

The manifestations of scrofula are numerous. In its Protean aspects it often puzzles the less expert diagnostician. But, in many cases a single glance is sufficient to indicate the nature of the affection. Among the poor children seeking relief in the dispensary clinics of large cities, a characteristic "scrofulous countenance" may often be observed. There is thickening of the lips and nostrils, usually some catarrhal discharge from the nasal passages, redness and inflammation of the edges of the eye-lids, and at times, a purulent discharge from the ears.

These patients constitute, however, but a small minority of the great

family of the scrofulous. A more numerous class is that described by some authors under the name of "pretty scrofula." In these the skin is thin and of a delicate tint, eyes large and brilliant, thin and translucent nostrils, bright red lips and generally precocious mental development. Children who present these characteristics should be well guarded during their school years, as they are especially prone to consumption, abdominal complaints, or brain affections. Over-study, confinement in a close ill-ventilated school room, or imprudent exposure in rigorous weather, will often be the determining occasion of irreparable mischief in these vulnerable individuals.

The scrofulous constitution manifests itself in eruptions upon the skin, of which eczema, abscesses and ulcers are most frequent and characteristic. Likewise, in catarrhs of the nose, throat and air passages, leading oftentimes to pneumonia and pulmonary consumption. Chronic enlargement of the tonsils is also a frequent consequence of the catarrh of the throat. Inflammations of the eyes, eye-lids and ears also occur often, and the latter not rarely lead to deafness, or even inflammation of the brain and death. A chronic discharge from the ears in a child should always be regarded as a signal of grave danger and be promptly treated.

In nearly all scrofulous individuals, the lymphatic glands, especially those about the neck become swollen, inflamed, and often suppurate. The appearance of these cases is characteristic and has given the disease its name.* Such suppurating glands have a tendency to continue for years, and are followed by extensive scars which disfigure the countenance of the patient to a still greater extent.

The scrofulous diathesis finds its most serious expression in the affections of the bones and joints. What is commonly known as "hip disease" is, in most cases, scrofulous destruction of the hip joint.

The gravest forms of scrofulous disease are those cases in which the bones of the spinal column are attacked. Here the morbid process destroys the bony frame work which maintains the body in the erect position, and by compression of the spinal cord produces paralysis with its discomforts and often fatal consequences. The application of the "plaster of Paris jacket," the brilliant and beneficent device of Dr. L. A. Sayre, enables many of these poor sufferers to live along in comfort when compared with their former condition.

For seven centuries in England, and for eleven in France, the dis-

* The name *scrofula*, from *scrofa*, a sow, equivalent to *Choiras*, a pig. It was believed to have been so named because swine are supposed to be subject to a similar complaint. It is more probable, however that the name was given to the swellings of the disease because the swelling of the glands when well developed gives the patient's neck an appearance resembling that of a pig. The word scrofula is first met in medical literature in the writings of Constantinus Africanus who flourished in the eleventh century. He was one of the most noted authors of the famous medical school in Salernum.

touch of kings was believed to be a sovereign cure for scrofula; hence the name, "the King's Evil." Dr. Johnson is said to have been the last person touched in England. This occurred in 1772 when the great literary autocrat was in his third year. Possibly the sex of the sovereign (Queen Anne) may be responsible for the lack of good resulting in this case. "At all events" says Carlyle, "poor Johnson had to go about girt with continual hypochondria, physical and spiritual pain."*

No cures have been found for scrofula in the multitude of new drugs discovered by physicians in the last third of a century. So far as the purely medicinal treatment of scrofula is concerned, the profession stands exactly where Lugol left it, forty years ago. Cod liver oil, iron, iodine and quinine, exhausts the list of our pharmacopœial resources, and even the first of these is rather dietetic than medicinal in its action. The others are most potent and valued medicines, but inadequate for the cure of the many manifestations of the strumous dyscrasia.

The question may very properly be asked here, whether no advances in the treatment of scrofulous diseases have been made in recent years? The answer is that, on the contrary, measures for the cure of scrofula have within the recent past been widely developed. In the first place the experiences of surgeons have shown that operative interference has been successful in a large number of cases in arresting the evil consequences of glandular suppuration, or the ulceration of bones and joints. With the comparative safety conferred by antiseptic precautions, surgeons attack scrofulous diseases with much less hesitation than formerly. Wherever the strumous process is accessible to the surgeon's knife, much may be hoped for from its bold but judicious use.

But what concerns us here, more than the cure of established or advanced scrofula (which is the affair of the physician and surgeon to whom I am not prepared to offer any advice upon this subject) is what measures can be relied upon to prevent the disease in one predisposed, or to restrict its ravages in one in whom the taint has already found expression. In other words, what hygienic measures can be effectively used against scrofula?

Bearing in mind the causes of scrofula, as before mentioned, the measures rationally indicated for its prevention are such as will remove, or mitigate the influence of those causes.

If it is true, as Dr. Holmes suggests, that the education of a child should be begun several generations anterior to its birth, it is no less true, that the preventive treatment of scrofula should begin before the strumous individual is born. Healthy fathers and mothers, living rationally with wholesome surroundings are not likely to be procreators of weakly, scrofulous children, while on the contrary consumptive, ill-nourished parents, living in violation of sanitary principles can hardly claim the privilege of having healthy offspring. It is necessary there-

*Carlyle: The Hero as Man of Letters.

fore, that prospective parents should be healthy—or at all events to try and be as healthy as they can.

But even when a child is born with the scrofulous taint, the latter does not necessarily find expression, if proper care be taken of it during the periods of infancy and childhood. The hygiene of childhood should be the especial study of all mothers. I may say that I know no more helpful publication to this end than the magazine "Babyhood," published in New York, under the editorship of Dr. L. M. Yale and Marion Harland.

The discussion of the questions of infant feeding, proper clothing, ventilation of living and sleeping rooms, school hygiene (including under this heading not merely the construction, heating and ventilation of school buildings, but also the proper methods of, and the time to be devoted to study, etc)., physical training, occupation, etc., would carry us too far from the special topic under consideration. I am glad to find also that the programme of this meeting includes papers on several of these subjects which will doubtless receive fuller elaboration than I could give them here.

Premising then that good food, pure air, appropriate clothing, sanitary surroundings and a right mode of living generally are especially important to those predisposed to, or affected by scrofula, I venture to call your attention more particularly to a remedy which possesses especial power in preventing the development of scrofula, and in arresting it when it has already appeared. This efficient remedy, the most puissant at our command, is prolonged life at the seashore. This was recognized so long ago as the middle of the last century when Richard Russell wrote a dissertation "Concerning the use of Sea Water in Diseases of the Glands," (Oxford, 1750). In 1796 the first special hospital devoted to the treatment of scrofulous diseases was erected at Margate, an attractive sea-side resort sixty-three miles from London. This institution is still in existence, and a few years ago received a large endowment from the late Sir Erasmus Wilson, a distinguished London physician, to whose munificence the English metropolis is also indebted for the Egyptian obelisk which graces the Thames embankment.

The largest sea-side hospital for the scrofulous is on the beach of Breck-sur-Mer in France. The *Hôpital Maritime*, called *Hôpital Napoléon* during the Empire, has a capacity for 734 beds, and is open the year round. The beginnings of this magnificent institution were of the most humble description. In 1857, a Dr. Perrochaud, with the aid of a sturdy woman of the people, the Widow Duhamel, sent daily a number of poor afflicted children from Grosfliers to the beach, where the little patients were bathed in the sea and allowed to romp and play in the warm sand. The exploits of the benevolent widow of Grosfliers are celebrated in the following verses which appeared some years ago in a London magazine:

"There was an old woman, she dwelt by the sea,
And a very good little old woman was she.
She took boys and girls that were sick, for her pleasure,
And told them to search on the beach for a treasure;
If they hadn't the strength so far to repair,
Her wheelbarrow merrily trundled them there.
They paddled and paddled and frolicked, and then
Her wheelbarrow trundled them all back again.

'And as to the treasure, my dears,' she would say,
'Twill be found sure to-morrow, if not found to-day;
The treasure of treasures, the wealthiest of wealth,
The jewel of jewels, my darlings, is health.'
So she gave them good broth with plenty of bread,
She wiped all their noses and put them to bed."

The great benefits derived from the treatment in this great hospital are shown by some statistics. From 1869 to 1882 there were treated in the hospital 4,692 scrofulous children. Of these 3,321 were cured, 148 improved, 127 unimproved, and 757 withdrawn by their parents or guardians. The number of deaths amounted to 339, or 7.2 per cent.

Belgium has a model hospital for scrofulous children at Middlekerke. It has a capacity of 300 patients. It was founded by the Vicomte Roger de Grimberge. Denmark has one at Refsnæs, Russia one at Oranienburg, Germany several in the islands of the north sea, the largest being at Norderney, and Italy and Austria are not only not behind, but the former country in advance of other nations in this benevolent and laudable work. In France several large endowments have recently permitted the construction of additional sea-side homes, the most important of which are at Nice, Cannes, Arcachon, and at Nantes.

Besides these regular hospitals which are open all the year round for the reception of patients, and to each of which a competent staff of physicians and surgeons is attached, there are in Europe a large number of seashore and mountain refuge stations to which scrofulous children are sent in the summer time only. In Italy alone there are about twenty such sea shore establishments, the first of which was opened in 1856 at Villa Reggia. In twenty six years over 50,000 poor or sick children had received the benefits of these humane institutions. A recent correspondent writes as follows of the sea-side hospitals in Italy.

"The infant mortality of Italy is still a slur on her civilization, and among her children who survive the bad upbringing in which defective nutrition is only one among many culpable characteristics, osteomalacia and rachitis are fearfully common. Concurrently with better education and sounder knowledge as to the management of infancy, there is also (it is satisfactory to note) a vigorous movement throughout the peninsula in favour of seaside hospitals, where the little sufferers from parental ignorance or neglect are admitted as patients, and their physical rehabilitation attempted under conditions most favorable to success. The benevolent among the laity are co-operating with the profession in establishing these institutions on every point of the seaboard and within easy distance of a great city, and those of them already in working on

the Latin shore—started, it is fair to say, some thirty years ago by the Papal government—are yielding signal proofs of their salutary effect. Year by year the number of cases relieved, if not actually cured, increases in proportion to the admissions; while as to these latter there is also evidence that, though rachitis may not itself be getting more common, the number of those who are made to benefit by the hospitals is distinctly rising. In 1855, for example, the admissions into the seaside hospitals of the Roman province were 517 in all; while in 1887 they were 667. This public recognition of the good effects of these institutions is manifested in many ways—the railway companies, for example, giving free tickets for the transport of the little sufferers from city to seaside, and financial houses like the Banca Nazionale subscribing liberally to keep the appointments, the working, and, above all, the dietary of the hospitals at as efficient a pitch as possible. Under the auspices of the Marchese F. Berardi, the official report of the "Ospizi Marini" of the Latin shore has just been brought out, and its details contain much that merits the attention of physicians in the British Isles, where such hospitals might be generally introduced or promoted with great advantage to the ill-fed, ill-developed children of our industrial centres. As I write, I receive the announcement that Palermo, mainly owing to the energetic initiative of Dr. Albanesi, Professor of Surgery in her University, is also to have her "Ospizio Marino"—a much-needed institution when we recollect the depths of ignorance as to the laws of health, personal and public revealed in the recent cholera visitations in Sicily. Thanks to the skilful finance and civic liberality, seconded by the gratuitous tickets of the railway and steam-boat companies, the institution starts under excellent auspices."—*London Lancet, May* 12, 1888.

In the United States, so far as known to the writer, no special hospital exist for the treatment of scrofulous diseases. There are a number of voluntary charitable organizations providing sea-side or country homes for sick children in summer, but these do not contemplate giving special medical or surgical attention to strumous patients.

Perhaps the Seashore House at Atlantic City comes nearer to what such an institution should be, but the practical philanthropy of wealthy Americans which seek outlets in so many directions, sometimes of doubtful good, perhaps, does not yet seem to have been turned in this direction. We have need in this country of permanent places of refuge at the seashore where the children of the poor who inherit a scrofulous constitution, or are afflicted with its active manifestations can be sent for treatment under the most favored conditions. The middle Atlantic coast offers many exceptional localities where such homes could be advantageously established. I regard it as an especial privilege to have been permitted to bring this matter to your attention, and I trust some practical results may follow.

34.—THE HYGIENE OF PUBLIC INSTITUTIONS.

By SELDEN H. TALCOTT, *Middletown, New York.*

The first essential to health in every public institution is a suitable location. This should be selected with a view of of securing purity of surrounding atmosphere, abundant supply of water, a thorough facility for drainage, and the disposal of sewage. Whenever practicable, the site selected should be a plateau of land so situated that there is an easy and natural slope in every direction. Such sites may easily be secured in almost any portion of the eastern, middle, and upper western states.

While it is sometimes desirable to locate a public institution near the sea shore, or along some river course, it is also wiser and safer to go beyond and above the valleys, and thus avoid, as far as possible, a foggy, or murky, or humid atmosphere.

A suitable site having been selected, the building should be constructed with a view of securing easy and abundant ventilation, and the rapid discharge of all waste material. Particular attention should be given to the foundation walls and the basement. These walls should not only be securely laid, but they should be thoroughly drained, both externally and internally. The floor of the basement should be absolutely solid and impervious to moisture. It should either be flagged and the joints carefully cemented, or a heavy coat of cement should be laid upon concrete. No pipes should be placed under the basement floor, except the necessary drainage pipes. All pipes for the conduction of water or steam, or sewage, should be hung up in plain sight, and where, in case of leak, they may be easily repaired.

The basement of every public building should be used for no other purposes than that of ventilation and heating. Basement windows should be large enough to admit and transmit constantly a large supply of fresh air.

The cooking in a public institution should be done either in the attic of the main building, or in a separate and independent structure. All stores of whatever sort or variety should be kept in detached buildings, and no fruits, or vegetables, or meats, or other articles liable to decay should ever be permitted in the basement of a public institution. No one should be allowed to sleep in the basement, for, if this is allowed, the air in the rooms overhead is quite certain to become contaminated.

All public buildings for the accommodation of either the sane or the insane should be no more than two stories in height. It is better to extend the buildings over a large area than to pile one story over another in a public hospital. Where patients are kept in a two-story building, it is easy, even for those who are weak, to readily go out upon the grounds; and, in case of fire, it is easier to save those who

are upon the second floor than those who might chance to be upon the fourth or fifth floor.

So far as practicable, the baths, water closets, lavatòries, and slop sinks should be located in separate towers, conveniently attached to each pavilion for the reception and treatment of the sick.

The plumbing should be absolutely perfect, as upon it depends, very largely, the healthfulness of the institution. All possibility of the escape of sewer gas into the wards and corridors should be scrupulously avoided.

After the sewage has been gathered into suitable pipes and removed from the building, it should be carried as far as possible towards the south or the north, and not towards the east or the west. Thus the winds will not bring back the offensive odors. The sewage should be conducted to large cesspools, and these cesspools should be emptied every twenty-four hours, by means of a siphon. The sewage, in order to be distributed without contaminating adjacent streams or without imposing upon those living in the vicinity of the hospital, should be distributed through an arterial net-work of drain pipes, located about one foot underneath the ground. This is the sub-irrigation plan of Mr. Waring. Before the sub irrigation tiles are laid, the land itself should be thoroughly underdrained with large tile pipes placed at least three and a half feet under the surface. Then the sewage distributing pipes should be so laid as to cross the regular drain pipes. In this way, the land may be thoroughly fertilized, while the unavoidable waste is filtered through two feet of soil, at least, and thus purified, it passes into the drain pipes to be carried away to some neighboring stream.

The walls of a hospital should be of brick or stone; or a wooden frame may be put up, and in this may be placed layers of mineral, so that in case of a fire, the walls may burn slowly.

All the main stairways should be of stone, set in brick walls, so as to be fire-proof.

The floors of all bath rooms and water closets should be tile, or slate, or cement. Wherever practicable, bathrooms and stairways and halls should be wainscotted with dry, hard wood, thoroughly seasoned, matched, and covered with a varnish or other preparation to prevent the ingress of moisture. All floors should be smooth, hard, and oiled, to prevent the absorption of foul matter. The side walls may be plastered, the last coat being a preparation of cement. The ceilings overhead should be covered with corrugated iron, instead of plaster; thus all danger from falling plaster is avoided.

Paint should be used freely in public buildings. Walls may be painted, while wainscotting may be oiled or varnished. Two or three coats of paint applied to an old wall seems to have a good effect in either fixing or destroying the germs of disease which may have lodged

therein. Where the walls are suitably tinted and decorated with stencil tracings, they may be made very beautiful and attractive, and thus conduce to the comfort and happiness of the patients.

The floors of the main halls in every hospital should be free from carpeting, and should be kept clean and highly polished. The same may be said of wards where those suffering with contagious or infectious diseases are being treated. In parlors and bed rooms of asylums, carpeting may be used, both for the purpose of rendering them homelike and cheerful in appearance, and also to make them somewhat more comfortable in the winter season. If a room cannot be carpeted throughout, then a soft rug should be placed beside each bed. The water supply in every hospital should be practically unlimited. Water is the great disinfectant, and should be used without stint or limit; but its application should be rapid and skillful. Every dusty floor should be mopped once or twice a day, but after the dust is removed with water, the water itself should be wiped up, and the floors left dry All water closets should be drenched freely and frequently with water, not only when the water closet is in use, but every morning and evening the water in every trap should be changed, even if that trap has not been in use. The fresh air supply in every hospital should be as constant and as free as the water supply. Air should not only be permitted to enter, but it should be forced to permeate every portion of every room and hall and corridor, at all times both night and day. The change of air should be slow, to avoid drafts, but it should be certain. Where the basement is absolutely clean, fresh air may enter it and pass by flues directly to every room. The foul air should be drawn out at the top of the building, from every room, by means of steam coils placed over the ventilators, thus creating and insuring a constant change of air. Air charged with carbonic acid gas should be forced out through openings near the floor.

Hygiene in public institutions includes not only proper construction, proper sewerage, and full supplies of fresh air and fresh water, but it should include also a consideration of food supplies. By making a wise selection of the varieties of foods which come within our reach, we may be able to relieve the unfortunate conditions and tendencies which exist always among the sick. Food should be furnished for the purpose of replenishing the wastes of disease, and also for the purpose of recuperating those who have suffered from long continued exhaustion through disease.

The best food having been selected, then special attention should be given to its palatable preparation for the use of the patients. Good cooking should be recognized not only as a fine art, but as an imperative necessity in every public institution. It is wise to remember just what are the effects of various foods upon the human system. Lean meat stimulates; fat meat relieves nervous erethism; vegetables sus-

tain life in a moderate and healthful manner; fruit purifies and cools the blood, and aids in keeping pure the general system; grain foods and milk nourish, upbuild, and recuperate all the life forces.

When the food of an establishment has been carefully selected, and skillfully prepared for eating, and wisely administered, then the patients subjected to such nourishment are most surely put upon the direct line to recovery.

We offer these few hints upon hygiene in public institutions more for the purpose of stimulating further discussion upon the subject, than with the expectation of enlightening those who have taken the trouble to listen to these suggestions.

35.—VENTILATION AND HEALTH.

By M. B. GOFF, LL. D., *Chancellor of the Western University of Pennsylvania.*

It seems a little singular that at this late date in the history of the world, men should be gathered to hear discussed the necessity that exists of surrounding those for whom they are bound to care with such safeguards as shall protect their most vital interests. This very subject in many of its aspects must have been discussed by nearly all the ancients, and especially by the Jews, to whom the Father of All gave such explicit directions as to the care they should take of their bodies, and the means they should employ to ward off the diseases that endangered their health and threatened their lives. We sometimes speak lightly of their numerous ablutions, and the care they took to "wash often," not only after performing such duties as preparing the dead for burial, but even after they had been "to the market." Yet when we come to examine the danger of contamination even in our market places, we begin to feel that perhaps we have judged too hastily. When we come to consider how readily the seeds of malignant disease cling to the skirts of those who come into close proximity to it, and the great danger there is of carrying from the bed-room of the infected, the germs that fasten themselves to our loved ones and hasten them to a premature grave, we may well hesitate to say aught against what has seemed to us so many unnecessary precautions. Nor were the Jews alone in matters of this nature. The Greeks and Romans, though not making hygiene a part of their religious duties, were far from neglecting it. The Laws of Lycurgus, says Dr. Gairdner, are not wanting in very pointed enactments on sanitary matters; and the importance attached by all the Greek republics, and in the Platonic ideal polity, to physical culture, is too well known to require remark. The Roman people, poor and apparently rude as it was in its origin, yet found time amidst its military occupations, to construct the "Cloaca Maxima," as an indestructible and stupendous memorial of its attention to the drainage and sewerage of the city at a very early period of its history. At a later

period aqueducts were made to cover miles upon miles of the surrounding plain; and their splendid ruins, still partly used for their original purpose, attest the munificence and abundance with which the first of sanitary requisites was supplied to the imperial city. Moreover, we know enough of the construction of the private houses and public buildings of the Romans to see that they recognized the necessity for free ventilation and good drainage. It seems strange that we to-day should be urged to do what was so thoroughly and willingly done in the ages of the distant past. In the paper we propose to present we cannot hope to go into a full discussion of this all-important subject. If we shall succeed in offering a few motives that will prompt to some action in the direction hinted at, it will be as much as we dare hope to accomplish.

In one way we moderns have at least made wonderful progress. When we grow ill we know where to go for relief. Those who have devoted themselves to the noble art of healing, have to such an extent and with so much zeal and success, investigated the causes and cures of the diseases to which the human frame is subject, that nearly all the ailments have been traced to their origin, and many whose cure was regarded as doubtful, readily yield to the present enlightened methods of treatment. In this we are, I doubt not, very much in advance of past ages. We are better able, too, to use the medical preventives which have been discovered to ward off dangers of approaching disease. And it is a well-known truth that the average of human life as a result of this knowledge and practice, has been greatly prolonged. But why may we not live, as did Methusaleh and the other ancient worthies? Why should we herald to the world as something extraordinary, the fact that a certain man died at the age of 100 years? Why should we speak with such wonder of the fact that a father who had attained the age of 98 years had walked three miles in one day, and the next had mowed all day side by side with his middle-aged son? Is it not possible that these things should be the rule and not the exception? I do not suppose that this could come to pass in a few years; it would probably take centuries to bring about such a state of affairs. Yet it seems to me that it would take no great stretch of the imagination to see with the mind's eye the man of 90 taking the place of young conductors on the railways, or handling the plow and harrow as do the men of 25 or 30 years. But of course this will not be until we have learned to obey better than we now do the behests of nature, and better follow some of her clearest promptings.

And now let us look for a moment and see if we can learn from Nature herself some of those things which are at least for our temporal good. There are many things which she gives us free of charge, and of these, two stand pre-eminent, air and water. The former abounds everywhere. Day and night, unless we shut it out, it is with us. Deprive us of it,

and we die. From its abundance and its necessity, does it not seem as if it were made for constant use? So, too, with water. The springs flow from the hill and mountain; they form the rivulet; join together in the brook; pour their volume into the creek; rush forth the mighty rivers, that "flow on forever." Is it not also made for our constant use? So abundant that nothing but the perverseness of human nature and its determined resistance to all pertaining to its own good, can destroy the beneficial effects intended by the Creator.

The chemist tells us that our atmosphere is composed in the main of the two elements, oxygen and nitrogen, in the ratio of 21 parts of the former to 79 of the latter. But that in this air there are ordinarily certain impurities, such as carbonic acid gas, watery vapor, and various fine floating substances arising often from the materials upon which workmen in the neighborhood are engaged.

Our physiologists tell us that every year we perform seven million acts of breathing, inhaling one hundred thousand cubic feet of air and thus purifying over three thousand five hundred tons of blood. A wonderful work, indeed, to be accomplished by each human being without his being aware that he has done anything more than eat, sleep and rest. We are, indeed, "fearfully and wonderfully made." But to accomplish all this what is necessary? A constant supply of fresh air. What pure air is as furnished us by Nature, our scientists have also taken the trouble to discover, and their report is, that what we call pure air contains four parts in 10,000 of a noxious gas, called carbonic acid gas; but that the diffusion is so great that the amount named may be taken into the lungs along with the nitrogen and oxygen without either discomfort or injury. But it is astonishing how little added to this quantity renders the air entirely unfit for use. Add two parts in ten thousand and we reach the limit of comfort and enjoyment; add two parts more, and we render the air burthensome to the lungs; two parts more, and we reach a point which is extremely dangerous.

Of what use is the air? Air is for the purification of the blood. Taken into the delicate air-cells of the lungs the oxygen is taken up by the blood; while at the same time the carbonic acid gas which has been collected by the blood in its passage through the body is given off as the breath. "The blood purified and laden with the inspiring oxygen, goes bounding through the system, while the air exhaled carries off the impurities." The amount of this impurity is estimated as being six-tenths of a cubic foot per hour from each adult. Suppose a man be placed in an air tight room containing just 10,000 feet of pure air (so called.) Remembering that this ten thousand feet contains four feet of carbonic acid gas, it is plain that at the end of one hour it would contain 4.6 feet; at the end of two hours, 5.2 feet, at the end of three hours, 5.8 feet; which is very nearly the limit for healthy breathing. At the end of four hours, 6.4 feet; and so on, till at the end of ten hours,

the 10,000 feet of air would contain 10 cubic feet of the noxious gas, rendering it utterly unsafe for inspiration. Thus it would seem, that at the very least calculation, a man in order that he may keep up even a sickly existence must have ten thousand feet of pure air each ten hours, or on an average, 1000 feet per hour. In like manner, it can be shown, that to reach a purity of nine cubic feet out of 10,000 he must be supplied with 1200 cubic feet of fresh air each hour; a purity of eight to 10,000 would require 1500 feet per hour; of seven to 10,000, 2000 feet per hour; of six to 10,000, 3000 feet per hour. This is on the supposition that a man breathes in the ordinary manner, making no special exertion of any kind. If, in addition, there was also a gas jet burning one foot of gas per hour, the estimate is, that this would equal in the vitiation of the air, the breath of one man for the same space of time. So that where 1000 feet were used, 2000 would now be necessary; and in five hours the entire vitality of 10,000 feet of pure air would be destroyed. Of course, if two jets of the capacity named were burning, an additional six-tenths of a foot of carbonic acid gas would be given out, and the vitality of the 10,000 feet of air be destroyed in about 3½ hours. And it is easy to estimate what would be the amount of vitiation in any particular case.

We have proceeded on the assumption that we can measure with precision and regulate with exactness, the amount of air we can supply to a room or hall. In practice, we shall find several circumstances that affect the supply both as to quantity and quality; of which we shall speak later. One thing is evident: were rooms air-tight, the larger the room the better for the occupant; and the smaller, the worse.

If, however, means be employed to supply fresh air from time to time no special harm can result in one's occupying comparatively small rooms. That, as a rule, by far too small a quantity of good air is supplied to those following in-door occupations, or who are confined on account of disease or injury, is quite evident from the reports collected by experts on this subject. The following is probably a very fair average of the number of cubic feet per hour allowed inmates of the places mentioned: Hospitals, 1200 cubic feet; middle class houses, 1000 feet; barracks, 600; good secondary schools, 500; ordinary boarding schools 130; workhouse dormitories, 300; lodging houses in London, 240; one roomed houses, 212. From which it is seen that a man living in a middle-class house (where there are no means of renewing the air), would destroy the vitality of all the air in a single hour. Imagine a human being closed up in an air-tight cell for a night of eight hours with only 1000 cubic feet of air to breathe! But this is trifling compared with what many would endure who are compelled to live in dwellings of much less capacity, but who, fortunately, often are unable to keep out the very means which affords them an existence.

It is to be remembered, however, that all the danger does not arise

merely from the fact that a certain amount of air has been consumed, and its place occupied by an equal bulk of carbonic acid gas. Within certain limits, as has already been hinted, the carbonic acid gas does no special harm. That given out by combustion is not so bad as that given out by the lungs. The blood, as it passes through the body, distributing the life-giving-elements, gathers up at the same time many impurities, and each expiration sends forth with the gas those fine particles of refuse matter separated by the lungs in the process of purification. To breathe carbonic acid gas in any degree of purity is to die by suffocation; to breathe over and over again the expirations from the lungs is to breathe approximately not only pure carbonic gas, but also the impurities of the system contained in this gas—the rapidly decaying organic matter cast off as useless and injurious by the organs of the body. Should the body be a healthy one, how loath should we be to inhale its impurities; should it be diseased, how much greater care should be taken not to allow our lungs to come in contact with its effete matter! If we are unwilling to breathe over again our own expirations, how much more unwilling should we be to inspire those of others! Your imagination can supply abundant suggestions of the revolting positions in which a man may be placed: the close proximity to fetid breath often experienced in a crowded and heated car, the densely packed church, the overflowing theatre, the closed carriage on the way to the cemetery, the "comfortable" air-tight guest chamber to which you are hospitably welcomed by kind and considerate friends, the crowded school-room in which are packed a hundred little souls who even with their bounding health can not prevent that which they expire from decaying and filling the room, causing you to stagger and reel as you attempt to pass their threshold. As we look at it and ponder over it, we wonder that we are so stupid, so inactive, do so little to remedy what is sapping the foundation of our lives, and, as some believe, of our very souls, unfitting us to perform well the duties of life, and causing us to be careless of the soul's immortal interests.

We look about us, and on every hand see the ill effects of a wanton neglect of the use of the very thing that has been given to us in the greatest abundance, and which we have without money and without price." "Everywhere, in the pale face, in the lustreless eyes, the languid step, we see the indications of a want of supply of fresh air. We see starvation in the midst of plenty. That child in the school-room is not wanting in intellect, but makes no progress, takes no interest; it is starving for pure air. That teacher is weak, dyspeptic, consumptive. He is dying for the want of fresh air. The minister wonders why his congregation sleeps while he attempts to present to them the loving kindness of their Maker, or heaps upon them in thunder tones the terrible threatenings of Sinai. They are simply dull from breathing their own and their neighbors' fetid exhalations. The

pleader at the bar is disgusted that with all his well-known and well-earned reputation for logic and eloquence, the judge and jury sleep. Nothing is proof against the insidious power of the air from which the living principle has been extracted. The physician, with all his skill, finds his patient daily grow weaker and weaker, and finally sink into his last sleep. He has simply failed for want of the exhilarating influence of the everywhere abounding fluid of which he has been deprived by the ignorance, penury, miserliness, or recklessness, of those who have him in charge.

Let us see if there is a remedy, and what it is. When such results as have been named proceed entirely from a want of pure air, the simple remedy is to obtain a proper supply. We can, of course, go out of doors, if we are well and have the time. But we cannot always sleep out of doors, nor perform all our labors in the "open space." We must have *protection* from the elements as well as their *good offices*. To obtain them requires both time and money. We have in late years made many forward steps. But much remains to be done. Our first duty is in our homes; there where all that we hold "precious and dear" are gathered, and where our restful hours are spent.

One thing prevents the ill effects that might otherwise be expected to follow what would seem to be poor ventilation; and this is that we cannot, if we would, make our houses air-tight; so that in spite of all our efforts to keep out cold or heated air, Nature steps in and defends our health, when we are doing much to destroy it. Neither wood, nor brick nor stone, can prevent the air from reaching the interior of our domicile be it ever so high or ever so humble. Our doors and windows leave openings for its entrance; so that at least one of the requisites for ventilation, to wit, an INLET for the air, is furnished for every house. These inlets, however, may be very far from accomplishing the most desirable results. The openings thus furnished may be productive of unpleasant and unhealthy draughts, may pass directly from the point of entrance to one of exit, and thus freshen only a very small portion of the confined air. Besides, if the room have another of the requisites needed for good ventilation, namely, an OUTLET, the pressure toward this opening may be so great that every time a window or door is opened, a deluge of cold air will rush in and destroy what should be a steady current setting toward the outlet. Thus, in an ordinary dwelling, the outlet may be, and very often is, the chimney, the heated air and gases in which being lighter, rise, or rather, are forced upward by the pressure of the colder air. This power has not only to do the work on the column of air within the chimney in setting it in motion and overcoming frictional resistance to its flow; but it has also to set the air entering the room in motion and to overcome frictional resistance at the inlets. In many instances, the latter part of the chimney's work is the more considerable of the two. From want of proper inlets air has to be dragged in at a high velocity and against much resistance.

The true remedy is to provide proper inlets. The discharge of air by an ordinary open fire and chimney varies widely, depending on the rate of combustion, the height, and section, and form of the chimney, and the freedom with which air is entering the room. When, therefore, a room is occupied by half-a-dozen persons, and air is to be supplied to them at the rate of 10,000 cubic feet per hour, it is probable that an ordinary chimney will serve the purpose of an outlet. If more than this number is to occupy the room, some additional means should be used, such as gratings in communication with flues leading to the open air, carry off the excess of impure air. Proper inlets for the air are of just as much importance as outlets. Their absence in a house where several fires are burning, forcing a great amount of air through the chimneys, involves a very serious danger. When air which must be supplied to take the place of that discharged by the chimneys can only struggle through small openings and the pressure within the house falls considerably below that of the outer air, the water traps, basins and closets are liable to be forced, and foul air is drawn in from every leak in soil pipe and drain. In this way, it has been found that a house was drawing what seemed to be its main supply of "fresh" air from a public sewer, through a defective joint between the soil-pipe and the (untrapped) house-drain. And it has been found on many occasions that some of our modern dwellings, finished in the highest style, and garnished with the richest coverings, have been merely the abode of disease and death, whither innocent mortals have been enticed in the hope of happiness and health.

While, then, we see the necessity for ample inlets for air, care must be exercised to avoid such currents of air as will give the disagreeable and dangerous sensations of draught. At ordinary temperatures, a current of outer air to which the body is exposed will be felt as a draught, if its velocity exceeds two, or at most three feet per second. The current entering the room may, however, be allowed to move at a speed much greater than this without causing discomfort, provided its direction keeps it from striking directly the person of the inmates. To secure this, it should enter, not horizontally, nor through gratings in the floor, but vertically through openings high enough to carry the entering stream into the upper atmosphere of the room, where it will mix as completely as possible with the warm air of the room before its presence can be felt. This I understand to be the opinion of J. A. Ewing, in the *Encyclopedia Brittannica.*

Many devices for this purposes have been tried, and with varying success. But there really seems to be no reason for this manner of introducing the outside air except the first one given, to wit: the prevention of contact between the draught and the persons of the occupant of the chamber. Consequently, any device that will prevent this contact should answer the purpose. It is even believed by some that no danger exists in sleeping in a room where a current of air passes over

the body of the sleeper; and that even should the current strike him the danger would be trifling did he but have his face toward it. However this may be, there is generally little need to run the risk. A simple contrivance within the reach of all, a muslin-covered frame placed at the top of the sash, occupying a part of its space, will admit the air, and avoid draught.

If, instead of fire places, houses are furnished with stoves for heating purposes, it is evident that all the precautions must be redoubled, and that the danger is greatly increased by the difficulty of keeping the stoves at a proper temperature, so as not to destroy by heat the life-giving principle of the air.

Hence, the ventilation of our school buildings is a matter of great interest to every parent; for a goodly part of the life of every child is spent in the school room. In the small buildings in the country, the same means of obtaining good air may be employed as in smaller dwellings. But in large educational structures the fire place and stove cannot be used to advantage, and a resort must be had to other means of heating. The necessity for this is manifest when we consider the number of children usually collected in a single room. On the supposition that fifty are present, there should be a supply of at least 40,000 cubic feet of fresh air each hour. That is, in each room containing fifty children there should pass into the room 800 cubic feet of air, and pass out of the same room the same number of cubic feet of vitiated air every minute; or, in a room thirty feet square and nine feet high there should be an entire change of air every ten minutes. This we take to be a very moderate estimate, the authorities varying greatly on this point, their estimate ranging from 300 to as high as 2000 feet per hour for each person.

In addition to having proper inlets and outlets, means must be employed to drive in and draw out—drive in the pure air and drive out the foul; and a perfect system for this purpose is a desideratum. Many plans have been projected; but none as yet is perfcet, though there are some very good approximations.

Another matter is the bringing of the air to the proper temperature. In some respects it would be preferable to bring the air from the outside directly into the room; but this is met with the objection that there is too much danger of suddenly chilling the air. The method of first heating the air in an outside chamber before introducing it, has the objection that when it enters a room it is much more apt to deposit on the walls the deleterious substance suspended in the air. There should be a mean between these two. The air admitted should be neither too cold nor too hot. And this can be arranged by allowing it to pass through a heated chamber, and if heated to too great a degree tempered with air admitted from without on its way to the room which is to receive it; valves being arranged so that air may be admitted from either source, and in quantities easily regulated.

Two other rules should be followed:

1. In whatever manner air be brought to the chamber, it should enter at a point at least three feet higher than the heads of the persons occupying the room, and never admitted through openings in or near to the floor; since such admission not only occasions uncomfortable draughts, but is apt to foul the air.

2. The outlets should be near the floor. It is well known that these rules are sometimes reversed, that the pure air is admitted through openings in or near the floor, and the impure air allowed to escape or be drawn off from openings in or near the ceilings, and with moderately fair results. But this latter method would not be our preference.

But we have more than occupied the time allotted to us. We have spoken almost wholly as to the importance of pure air as a hygienic factor. There are other factors quite as important.

As we have said, our health, our lives, are dependent on the air we breathe. But what has been said and what yet remains to be said as to our daily food, our habits, the climate we choose, the land upon which we locate our dwellings, the clothing we wear, the tempers we cherish, the passions we gratify or repress, and the thousand and one things that have a bearing on our hygienic condition? These are all matters that demand our serious, earnest attention, and call upon us, as we value our own lives and those of our families and friends, to be up and doing that the sanitary condition of our people may be improved, and valuable lives longer spared to act well their part and be a blessing to the nations.

No man endowed with the single sense of smell can walk the streets of these two cities without a solemn conviction that disease and death lurk in the damp and noisome cellars of many of our dwellings; that foul and decaying matter, beside pouring its flood of sickening smells upon the passer-by, is finding its way into the upper floors of these same houses, and endangering to an alarming extent, as we were yesterday so forcibly reminded, the lives of their inmates. The Almighty has showered upon us advantages exceeding those granted to any other people in that he has given us a fuel* that yields its results without an effort on our part. Yet upon every hand, are we saluted with the sickening odors of imperfectly consumed garbage, as it comes from the chimneys of our bakeries and manufactories where one would expect all cleanliness to be present, and this simply because a few cents daily may be saved from the hands of the man who carts away our rubbish. What the Jews had left over after certain days, was to be *entirely* consumed. I fear our combustion is not in accord with the Jewish law.

We have now, as you see, scarcely reached the threshhold of our subject; but had our chairman been strict he would some time ago have "called a halt;" and lest he should be tempted still to do so, we leave

*Natural gas.

these matters with you, hoping that you may have determined on your part, to do all that lies in your power to bring about the age when men of a hundred years shall be no more of a curiosity than now are those of fifty.

36.—THE SMALL POX AT NANTICOKE.

By LEWIS H. TAYLOR, M. D., *of Wilkes Barre, Pa.*

The Steamship Rugia, from Hamburg, which arrived at New York, December 2d, 1888, brought, among other passengers, two families of German Poles named Liezkowski, who came directly from Castle Garden to Nanticoke, arriving December 4th or 5th. They went at once to live with relatives of the same name in that part of Nanticoke, known as Honey-pot.

On December 24, Dr. Daniel Evans was called to attend a child, aged two years, in the Liezkowski family, in which the newly arrived emigrants had taken their abode. He found the child suffering with small-pox, and a brother partly convalescent from the same disease, no physician having been previously called to the latter patient, although he had been ill since December 17.

Dr. Evans at once reported his suspicions to the borough council, and that body, through its sanitary committee, requested another physician, Dr. Holly, to investigate the matter also. This he did, finding two cases of genuine small pox.

The house in which these patients lived was immediately quarantined and no one allowed to enter. A pest-house was built as soon as possible, at least seven hundred yards from any other building, and these two patients were removed to it. The younger child died January 1st, 1889.

These children were not of the emigrants, but were living in the house to which the newly arrived emigrants came, and the question naturally arises at this point, whence came the contagion? Subsequent investigations revealed the fact that a boy of Franz Liezkowski's family that arrived in New York, December 2d, was slightly sick and had a few eruptions on his body soon after they moved into the block where the disease made itself manifest. Clearly then, in this account we have the origin of the trouble.

Had the sanitary committee displayed the same zeal and judgment in managing subsequent cases that arose as they did in the beginning of the trouble, there would have been no occasion for this paper, nor would there have been over fifty cases of this loathsome disease as a public charge upon the borough and district poor board.

At the time of the breaking out of the disease in the Liezkowski family, there were twenty-nine persons in the tenement house who were presumably exposed to the contagion, and of these the following developed the disease in the modified form:

Joseph O., æt. 17, vaccinated, taken ill January 12th, 1889.

Frank O., æt. 15, vaccinated, taken ill January 13th.

Agosta O., æt. 12, vaccinated, taken ill January 14th.

Martha O., æt. 6, vaccinated, taken ill January 14th.

Josepha O., æt. 2, vaccinated, taken ill January 17th, died January 22d.

Martha D., æt. 2, vaccinated, taken ill January 16th.

Madrisa Liezkowski, æt. fourteen months, vaccinated, taken ill January 18th.

Martha Liezkowski, æt. 2 years, vaccinated, taken ill January 17th. Eight in all.

These with one exception recovered, and so far as can be ascertained, the disease did not spread directly from any of them, though they were not removed to the pest house.

Frank Haney, æt. 29, not vaccinated, was employed as watchman at the pest-house in which the first two cases were placed.

The child that died January 1st, in the night was placed in its cradle outside of the pest-house, and the watchman returning from town in the morning so found it. He was much frightened, returned to his home in the centre of the borough, and on January 7th, was taken ill with the disease in confluent form. He was not removed to the pest-house, but was treated right near the centre of a populous town, in a quarantined house it is true, but as subsequent events show, not with precautions sufficient to prevent the spread of the contagion. Had he been removed and his house thoroughly disinfected, in all probability, the epidemic could have ended at this stage; for from this patient directly or indirectly arose nearly all of the subsequent cases.

His three children, Peter, æt, 7; Susan, æt. 11; and Julia, æt. fourteen months, were taken ill from January 22d to 24th.

Catharine Ebdon, æt. 29, not vaccinated, living in the same house, and Mary Reese, æt. 22, not vaccinated, living about a hundred yards away were taken ill about the same time, *i. e.*, January 24th.

The latter was ill five days, in a house containing thirteen in family, before her disease was pronounced small pox; she was then removed to Haney's house and there recovered. The other members of her family were vaccinated and none of them took the disease.

The next patient Mrs. Charles Wagner, æt. 22, not vaccinated, taken ill February 2d, lived in West Nanticoke, across the Susquehanna river nearly a mile away from the other cases, and neither her physicians nor friends could give any history of contagion.

The only possible source was found in the fact that her husband, a teamster, constantly visited Nanticoke and it was thought possible that he might have carried the disease to his wife without becoming affected himself. This patient was carefully quarantined and treated by Dr. Morris, and no other cases appeared in West Nanticoke.

The next, William Beddow, æt. 22, not vaccinated, taken ill February 12th, could give no positive history of contagion. His brother, Henry Beddow, æt. 6, not vaccinated, taken ill March 1st, evidently contracted the disease from William.

Following these we have a group of cases consisting of Nora Mack, æt. 21, not vaccinated, taken ill March 1st.

Mamie Mack, æt. 9, not vaccinated, taken ill March 14th.

Joseph Mack, æt. 5, not vaccinated, taken ill March 14th.

Mary Mack, æt. 28, not vaccinated, taken ill March 17th.

Nora Clifford, æt. 19, not vaccinated, taken ill March 21st; and all closely related, and all living together. These illustrate one of the difficulties in dealing with small pox, which will be touched upon further on, viz: the failure of patients to report illness. The history of this group is not positive, but the generally accepted opinion is that a brother of the sisters, Mrs. Mack and Miss Clifford, had the disease in a light form, and did not call a physician to attend him, subsequently his two sisters became infected and died. The others of the family recovered.

In the history of the next group, the Walton family, we have also an unfortunate circumstance that tended greatly to spread the contagion. In this family a man, his wife and one child were treated for chicken pox in the latter part of March. Before they were quite well two other children in the house were taken ill and the disease then correctly pronounced small-pox. Before these patients were quarantined, probably a number through visits to them were exposed to the contagion. Matilda Frank, æt. 29, vaccinated, a sister of this family was taken ill April 3d.

John Tibbs, æt. 20, visiting officer of a lodge, called on the above mentioned family while they were supposed to be suffering with chicken pox only.

Eugene Alexander, æt. 53, vaccinated thirty years ago, a poor director was taken ill April 22d, and removed to the pest-house. It is supposed that he contracted the disease in the discharge of his duty as poor director.

The next group:—

John Needham, æt. 23, not vaccinated, taken ill April 3d.

Mary Needham, æt. 23, not vaccinated, taken ill April 4th.

Joseph Needham, æt. 2, not vaccinated, taken ill April 16th.

Josephine Toole, æt. 20, not vaccinated, taken ill April 16th.

Terrence Needham, æt. 16, not vaccinated, taken ill April 16, and all lived in a house just across a small alley to the Mack family, previously mentioned. These houses have windows opposite each other.

Ernest Munt, æt. 37, taken ill April 13th, lived near Beddow who was probably convalescent in the latter part of March.

Richard Hughes, æt. 20, not vaccinated, taken ill April 10th, was clerk in a drug store, and lived near the Mack family. He was broken out

nearly a week before it was discovered that he had small pox; then instead of being taken to the pest-house he was allowed to return to his father's house some distance away. His brothers and sisters were sent away until he had presumably recovered, when they returned, and all took the disease, the father also becoming affected. These were, besides Richard, Edward Hughes, æt. 13, not vaccinated, taken ill May 10th.

Mary Hughes, æt. 9, not vaccinated, taken ill May 10th.

Eneuris Hughes, æt. 15, not vaccinated, taken ill May 13th.

Ziba Hughes, æt. 7, not vaccinated, taken ill May 12th.

Selina Hughes, æt. 11, not vaccinated, taken ill May 12th.

Richard Hughes, Sr., æt. 40, not vaccinated, taken ill May 14th.

These absolutely refused to be vaccinated. All except the first one ill of the family, Richard, Jr., were removed to and treated at the pest-house. Eneuris, æt. 15, died May 19th.

The next group of four, consisting of Thomas N. Davis, æt. 28, vaccinated, taken ill April 18th.

John Lewis, æt. 5, vaccinated, but did not take, taken ill April 18th.

Mary Blackwell, æt. 7, vaccinated, but did not take, taken ill May 13th.

George Daniels, æt. 23, taken ill May 20th, were all visitors to the Hughes family, and presumably took the disease form them. These were all removed to the pest-house.

Thomas J. Evans, aged 14, vaccinated, but did not take, taken ill April 13th, and J. Evans, aged 15 months vaccinated, taken ill May 1st, were children of the small pox physciian, and were removed to the pest-house, as was also Sarah Jones, a domestic in the same family, a very light and irregular case.

Thus far six deaths have occurred, and over fifty cases have been treated; the deaths excepting the two very young Polish children were all in unvaccinated persons. There are at present, June 1st, eight cases under treatment, all in the pest-house.

The history of this epidemic of small pox presents to us certain points of interest, that may well engage our attention for a short time on this occasion, as well as certain lessons and warnings that all should heed; and I desire to allude briefly to a few of these hoping that a free discussion of the same may possibly aid us in future dealings with this scourge.

First then, why should Nanticoke have had any small pox at all?

These emigrants that came in the Rugia came from a district in Poland, said to have been at the time of their departure infected with small pox, and they certainly brought the disease with them though the quarantine authorities at New York, state that no case of small pox appeared on the Rugia later than October. This, they say, was

carefully isolated and disinfected, but nevertheless the fact remains that the disease was brought to Nanticoke and the immigrants who came in that vessel, arriving December 2d, brought it. Had there been stricter quarantine regulations and more searching examinations of passengers, the contagion might possibly not have been carried.

Secondly, having the disease in the borough, why should it be allowed to spread?

When I first visited Nanticoke to investigate the reports concerning small pox, on January 7th, 1889, in response to instructions received from the Secretary of the State Board of Health, I found that a pest-house had already been built, the first two cases removed to it, and that the exposed persons had been vaccinated.

The council seemed alive to the responsibility and its Sanitary Committee anxious to take all necessary steps to stamp out the disease in its inception.

But the first error of all was in employing as watchman at the pest-house a man who had never had the disease, and who had not even been vaccinated; and the second was, in allowing this man after he had contracted small pox to be treated in his own home instead of removing him to the hospital. The chairman of the borough council stated to me subsequently that the committee desired to remove him, but his physician would not consent, saying his patient was in such a condition that his removal would not be advisable. Argument in favor of pest-houses for the treatment of this disease and for the forced removal of all patients to them, should not be necessary in this day, and yet we find it a difficult matter to impress upon the local authorities and upon patients themselves the importance of this measure. We say then, that the failure on the part of the sanitary committee to remove all of these cases to the pest-houses as recommended by local physicians and the medical inspector was a serious error in the management of the epidemic and contributed largely to the spread of the disease.

A third error is found in the fact mentioned in the early part of this paper—the great difficulty in getting a certain class of people to report cases of small pox, or to place patients under a physician's care.

We can correct this largely by educating the masses through the public schools, the public press if necessary, and by circulars of the State Board of Health upon the subject of contagious diseases in general, and especially upon the importance of letting the presence of such be known to the proper authorities immediately.

A fourth difficulty is in error of diagnosis. How shall we meet this? By quarantining every suspected or doubtful case until its true nature can be determined. In times of a small pox epidemic every case of suspected chicken pox should at least be quarantined as small pox, and so treated until all danger is passed.

A fifth difficulty so far as this local epidemic is concerned, and a serious one, came from the failure of the borough council to complete its organization and enact suitable ordinances to meet the emergencies that might arise. At my second visit, January 21st, I found nine patients in all, and these were quarantined in two buildings. But two new cases appeared in February, one of these being in West Nanticoke. The term of the efficient chairman of the council, as well as that of two other members expired March 1st, and the new council on account of deadlock on the question of secretary were unable to transact business. The matter of caring for the epidemic was left in the hands of the standing committee, who were unwilling to take the necessary responsibility and incur the necessary expense unless backed up by ordinances of council—the council could pass no ordinance because of the deadlock on the question of secretary. Six new cases appeared in March; the disease spread rapidly in April, and the situation called for prompt measures.

Upon the urgent recommendations of the medical inspector, and of the local physicians of Nanticoke, unanimously presented, and further strengthened by resolutions of citizen's meeting, held for the purpose of sustaining the sanitary committee in incurring necessary expense, the committee was finally induced to adopt more stringent measures toward abating the nuisance. Free vaccination was at once inaugurated, an old pest house in use some years ago was repaired, a third built, and all subsequent patients removed to these buildings.

Such are some of the errors and difficulties in managing this disease. How shall they be avoided here and elsewhere in the future?

1. By more efficient quarantine regulations and inspection at our ports of entry.

2. By education of the masses upon the subject of contagious disease.

3. By the establishment in all cities and boroughs, and even in all townships if possible, of local boards of health, with competent intelligent officers, and with definite authority delegated to them; so that, without awaiting action of councils they might proceed at once to cope with epidemics of contagious disease in their very inception. These local boards would be under the general direction of the State Board of Health, and should have placed at their disposal a contingent fund for necessary expenses in such matters, or at least be authorized to incur such expense as is necessary in carrying on their work without awaiting special appropriation as must be done by sanitary committees in cities where no boards of health exist.

APPENDIX E.

THE OPERATIONS OF THE BOARD IN CONSEQUENCE OF THE FLOODS OF MAY 31, 1889.

I. Johnstown and the valleys of the Conemaugh, Kiskiminitas, Allegheny and Ohio.
II. The West Branch of the Susquehanna.
III. The Susquehanna.
IV. The Juniata.

I.—JOHNSTOWN AND THE VALLEYS OF THE CONEMAUGH, KISKIMINITAS, ALLEGHENY AND OHIO.

1. Report of W. E. Matthews, M. D., Chief Deputy Medical Inspector at Johnstown.
2. Report of Geo. W. Wagoner, M. D., Deputy Medical Inspector for the Kernville District.
3. Preliminary Report of the Secretary of the State Board of Health on the Sanitary Condition of the Flooded Regions in Cambria, Westmoreland, Indiana, Allegheny and Beaver Counties.
4. Organization during the early period of Operations of the State Board of Health at Johnstown.
5. Orders and Telegrams sent from Nineveh, June 2d.
   a. Telegram to the Sheriffs of Counties in the Devastated Region.
   b. Message to the Superintendent of the Pennsylvania Railroad.
   c. Telegram to General D. H. Hastings.
   d. Communication to the Coroner of Westmoreland County.
6. Telegram to Governor Beaver.
7. Telegram from John B. Hamilton, M. D., Supervising Surgeon General United States Military Hospital Service.
8. Orders from J. B. Scott, Director.
9. Authority to obtain Disinfecting Utensils.
   b. Memorandum of articles obtained.
10. Telegram from the Secretary of the State Board of Health of Ohio.
11. Offer of Services from Major M. Veale, late Board of Health Officer of Philadelphia.
12. Copy of Letter from Supervising Surgeon General J. B. Hamilton, United States Marine Hospital Service.
13. Protection of the Water Supply of Johnstown.
   a. Report of an Inspection by Doctors Probst and Carrington.
   b. Analyses, June 18th.
   c. Communication to the President of the Johnstown Water Company.
   d. Analyses, August 10th.

14. Contribution of Disinfectants from Messrs. Quibell Brothers.
    a. Telegram from Office of Supervising Surgeon General Hamilton.
    b. Letter of Messrs. Quibell Brothers.
    c. Acknowledgment by the Secretary.
15. List of Disinfectants and the Donors
16. The Use of Rosin in the Destruction of Carcasses.
17. Letter from Col. Louis W. Read, Surgeon General National Guard of Pennsylvania.
18. Communication from the Office of the Chief Engineer of Operations in Johnstown.
19. Decision with regard to Portable Houses.
20. Report of the Committee on Home Sanitation.
21. A Sunday in Johnstown.
    a. Report of Head Quarters of Sanitary Corps.—Distribution of Disinfectants.
    b. Report of the Bedford Street Hospital, by Dr. J. C. Sheridan.
    c. Report of the Red Cross Society, Camp Barton.
    d. Report of the Cambria Hospital.
    e. Reports of Inspectors.
    f. Report of the Military Camp.
    g. Report of the Laborer's Camp.
    h. Report of the Morgues.
    i. Report of Major Silliman on the Dead.
22. Condensed Daily Report of Diseases and Sanitary Condition of Johnstown.
23. Requisition for a Military Guard.
24. Articles of Agreement with C. McLean & Co.
25. Resolutions of Thanks to Volunteer Physicians, and to Officers of the Department of Public Safety of Pittsburgh and the Board of Health of Allegheny.
    a. To Physicians.
    b. To the Officers of the Department of Public Safety and the Board of Health of Allegheny.
    c. List of Officers and Employés of the Department of Public Safety of Pittsburgh who rendered service at Johnstown.
    d. Board of Health and Sanitary Police of Allegheny City who were present at Johnstown.
26. Military Guard.
    a. Thanks for Guard for Offices and Stores.
    b. For Polluted Spring.
27. Order forbidding the sale of flood soaked food.
28. Order to abate a special nuisance.
29. Notice to Dealers in Fertilizers.
30. Sanitary Condition of Peelorville.
31. Distribution of Labor Corps.
32. Daily Expenses of Sanitary Corps, August 6th.
33. Correspondence with regard to Engineering Work on the River.
    a. Letter to James McMillan, Esq., Chairman of Finance Committee.
    b. Letter to President Harrison.
    c. Letter from President Harrison.
    d. Letter from Supervising Surgeon General J. B. Hamilton.
    e. Circular of the United States Treasury Department on appropriation for Epidemics.
    f. Letter to Supervising Surgeon General Hamilton.
    g. Letter to the Pittsburgh Post.
    h. Letter from the Supervising Surgeon General Hamilton.
    i. Communication from the Johnstown Board of Trade.
    k. Reply to the Johnstown Board of Trade.
34. Reduction of the Sanitary Corps.

35. Correspondence with reference to the Pollution of Rivers,
   a. Communication from the Cambria County Medical Society.
   b. Reply by the Secretary of the State Board of Health.
   c. Letters of Instruction to Captain G. C. Hamilton, Chief Engineer, Johnstown.
36. Bulletins issued by the Board.
37. Forms issued by Chief Engineer Hamilton requesting inspection of cellars.
38. Disinterment of the Unidentified Bodies.
   a. Letter of Instruction to the Committee.
   b. Report of the Committee.
   c. List of Permits for Disinterment and Transfer.
39. Operations subsequent to the meeting of the Board, Sept. 27th.
40. Communication to His Excellency Governor Beaver declaring the Nuisance Abated.

1.—REPORT OF W. E. MATTHEWS, M. D. CHIEF DEPUTY MEDICAL INSPECTOR AT JOHNSTOWN.

Dr. BENJAMIN LEE, *Secretary State Board of Health.*

DEAR SIR:—I have the honor to submit this, my final report, of the work performed by the State Board of Health forces in the Conemaugh valley since the disaster of May 31, 1889.

On two occasions I have submitted hastily written reports of the work accomplished by the Sanitary Corps. This report is designed to cover more fully all the difficulties that have confronted the corps, to give a more detailed account of the grand work of meeting the requirements of the hour, the magnitude of which they recognized at the outset. No other Board of Health has ever been confronted by a task of such herculean proportions; how well they met and performed that task is evinced by the fact that no epidemic followed the disaster.

In presenting this, a retrospect of Pennsylvania's greatest calamity, I have only to say that it is simply given as a preface, a general outline of the cause and extent of the nuisance which you called on the governor of the state to abate. I do not essay the impossible task of picturing the scenes, or telling of the thousands of horrors that accompanied the devastation. Records of the dead in a dozen morgues tell how densely the shadow of death enveloped the valley.

Specialists in meteorology claim that three storm centers met in a dire embrace upon the summits of the Allegheny mountains and were held in check on the east by a wall of high barometric pressure. We know that the storm stood as if anchored above the crests of the Alleghenies, and for thirty-six hours discharged an amount of rainfall unprecedented in the history of this country—about seven inches of water falling in fourteen hours. The headwaters of the north and south forks of the Conemaugh were in this gigantic atmospheric disturbance. The greater part of the watershed of the forty square miles, contiguous to these two

mountain streams, drains toward the west into the Conemaugh valley. Stony creek, rising in the south and flowing northwardly along the base of the main range of the Alleghenies, empties into the Conemaugh at Johnstown. The combined floods from these three mountain streams submerged Johnstown on the morning of that ill-fated Friday, five feet deeper than ever before known.

People were imprisoned in the tops of their houses and entirely cut off from aid.

Nine miles up the valley and among ridges of the Alleghenies, nearly six hundred feet above Johnstown, was a reservoir called Conemaugh lake, a body of water over two miles long, nearly three-quarters of a mile in width and from ten to fifty feet in depth. At 3.15 in the afternoon, when the water in Johnstown had reached the second floor of many buildings and had already receded an inch or two, the water in the lake overflowed the dam. In a few moments the overflow washed out a large section of the dam, and scarcely fifteen minutes later the lake was empty, the whole valley a mass of seething waters and the crowning calamity of the century, for this country at least, was being enacted.

This immense body of water formed, with its accompanying debris, a resistless wave the full width of the valley, sweeping the pine-clad hills on each side, and stripping them to the naked rock. It denuded the valley for a distance of twelve miles and left it a total ruin, a river bed filled with massive rocks and stones many feet deep. In fact, it was so clean that the medical inspectors, in making their survey, found nothing of an unsanitary character to report. The mountain of water came with terrific force, holding in its embrace, engines, cars, bridges, boulders, houses, trees and massive machinery which ground to fragments everything in its path. All were caught up and rolled over and over to be left, a heap of twisted iron and splintered wood, half buried in the sand and mud. It was a moving mountain of shattered homes and ruined industries. Where before stood immense brick and stone buildings not even a trace could be found.

The torrent of water, when it reached Johnstown, about forty-five minutes after it left the lake, was at least twenty feet high. It struck Johnstown and its contiguous boroughs, giving its thirty thousand inhabitants but a minute's warning. The wave, pushing before it all the material it had gathered in a twelve mile rush, plunged through the town without regard to the river's channel. Its force carried it some distance up the Stonycreek valley; it struck the mountain side and rebounded, and at the stone bridge of the Pennsylvania railroad it piled the debris more than forty feet high. The piling up of wreckage over so many acres of ground formed a dam that even this terrible power could not move, and the waters were held in check until the railroad embankment gave way. Then with an awful rush they carried destruction and death to Cambria City. This check in the flood's rapid course

caused the waters to surge back and forward, forming whirlpools and eddies—a mælstrom of seething waters and a wilderness of grinding, crashing buildings. All this was done in less time than can be conceived. Professor Sanders, who stood on the highest point of the Morrell Institute building and had an unobstructed view of Johnstown and the waters, said: "The destruction of the city was almost instantaneous; the eye could not follow the racing waters. At some points the flood ran like a high sea, throwing logs and debris high above the water, at other points the pressure exerted forced the water to rise vertically in a body. There was an awful absence of human cries. The onslaught was so sudden that the people were unable to shriek their despair. A cloud of dust arose from the city and for a moment was suspended above the waters, and as in terror I whirled around to face the stone bridge, I saw the water returning, Johnstown the centre of a mælstrom."

The horror of the scene that followed was graphically portrayed by the Johnstown Tribune, in its first issue after the flood, and the following extract is submitted in place of an attempted description.

"In a moment Johnstown was tumbling all over itself; houses at one end nodding to houses at the other, * * * And on sped the wreck in a swirl, the angry water, baffled for a moment, running up hill with the town and the helpless multitude on its back, the flood shaking with rage and dropping here and there a portion of its burden, crushing, grinding, pulverizing all. Then back, with great frame buildings floating along like ocean steamers, upper decks crowded, hands clinging to every support that could be reached, and so on to the great stone bridge, where the houses, piled mountain high, took fire and burned with all the fury of the hell you read about—cremation in your own home, perhaps a mile from its foundation; dear ones slowly consumed before your eyes, and the same fate your own a moment after."

The water receded rapidly until it reached the level of the break in railroad embankment, but all night the site of the town was filled with a vast lake of water. Shrieks for mercy were unavailing; human skill was powerless to save the hundreds who were imprisoned in the wreckage. The burning pile lit up the turbid waters of the dismal lake beneath which slept thousands cold in death. Few eyes closed that night except in death, for those who escaped to the hill-sides kept vigilant watch through the long, dreary hours of the night, as did others with only a foothold on some partially wrecked building, shivered, in driping garments, in the cold night air. Many died from shock, exposure and wounds through that long age of night. Death! Silence! Eternity! What names of terror to the beings who longed and prayed for deliverance in the darkness, and amid the din of crumbling walls.

At length morning came, and the muddy waters had sufficiently subsided to allow the work of rescuing the perishing to be commenced, but amid scenes of desolation that cannot be pictured. There was wretch-

edness on every side. Horrors piled on horrors! Wrecked hearts, bankruptcy, orphanage, widowhood, childlessness, obliterated homes! Wreck, ruin, and a deposit of slimy mud, in some places five feet deep, covered the site of the town.

At an early hour the survivors began to realize their position. The flood of terror had been succeeded by the calm that precedes a storm of insanity. After some hours this gave place to a desire to obtain food and shelter, a place of safety; to find friends, loved ones. They realized that they were face to face with fate and future. They must do something. Action severed the cord of madness and brought the living to their senses. But where to go, what to do, no one could tell. Many wandered aimlessly around. Over and under the wreck they went, in and out of the ruins, seeking yet dreading, to find a friend. Some could be seen standing stunned and tearless by the disfigured clay that once was instinct with a life closely linked with theirs. Some survivors, for days and days, walked and talked among the ruins of their former homes without shedding a tear or dropping a word of sympathy. Some, for weeks, travelled up and down and over the wreckage, seeking the members of a lost family amid scenes so harrowing, that it is a marvel that any one could look upon them and escape insanity.

There were left, however, strong hands and brave hearts, and these commenced the work of rescuing the injured, the aged, the weak, and removing the dead.

In a walk, the morning following the disaster, scarcely a step could be taken without discovering some dead body. In one place sixteen bodies were found together, crushed and mangled beyond recognition.

In a walk from the lower to the upper end of Main street, over fifty dead bodies were counted. The débris was filled with the dead bodies of human beings and animals. As soon as possible, morgues and hospitals were opened, and the exposed dead and injured removed. This work was attended with many difficulties. They had to be carried long distances and over almost impassable wreckage.

In the afternoon people began to reach Johnstown from the country and to bring much needed assistance—a silver lining to the dark cloud of death, that touched the hearts of the wretched survivors.

Sunday, the second day of the disaster, the sky was cloudless and the sun's rays warmed up the shivering community. The outside world commenced to extend its sympathy, to invade the town, to help extricate and bury the dead and feed and clothe the twenty thousand survivors. In their greatest hour of need, when the valley was still covered with water, and when its suffering people were literally shut in, the world opened her heart and unloosed her purse-strings to succor the living and perform the last sad rites for the dead. Words will never convey an idea of the noble work done by the various relief committees upon their arrival at Johnstown.

On this, the Sabbath day, Johnstown was the scene of confusion; thousands of strangers crowded the ruined city; every avenue of relief swarmed with generous and noble workers. There was a tremendous demand on human energies. The dead everywhere—hundreds in the morgues—thousands to be recovered. The demand for coffins, undertakers, men to excavate the graves and teams to carry the dead, was most urgent. But the gray mists had scarcely arisen from the hills in the morning until hundreds of funerals were coursing their green sides. Without a friend to drop a tear, hundreds have been lowered into unmarked graves, and in this life their fate to friends will never be known. All day the work went on and still the morgues were full, more than four hundred bodies being recovered. The corps of seventy-five undertakers toiled from sunrise to sunset, and day after day, to consign the army of the dead to its last resting-place.

The immense pile of wreckage at the great stone bridge continued to burn, to rage over the tangled graves of—only God can tell how many. Mothers and fathers hung around the morgues for days and weeks searching for a missing face. Some haunted them for months, going from one to another and never missing a day. While some were finally rewarded, the weary searching of others was in vain.

Enough has been said to convey, in some measure, the conditions and urgent needs that confronted the officers of the State Board of Health on the morning of June 3d. No other set of men in all the flooded district had a more difficult, laborious and painful task before them.

In giving a history of the operations of the sanitary corps, we labor under some disadvantages from not having full data from which to compile it. Considering the confusion that reigned in the valley during the awful two weeks succeeding the flood, it is remarkable that any organization was effected and records kept. We regret that we cannot at this time include a complete record of the disinfectants received and used. Large quantities were donated, and we would like to give the donors due credit. In many cases disinfecting material was unloaded from the cars and distributed in different places without any account being rendered to our department. Some work was performed by volunteers and they left without rendering to the office a report of their services, or of those who worked under their direction. Few of the inspectors rendered an itemized report of the work performed in their districts. This history, therefore, must be to some extent, a general one.

History of the Sanitary Work.

On the morning of June 3d, Dr. Benjamin Lee, Secretary and Executive Officer of the State Board of Health, and Dr. G. G. Groff, a member of the Board reached Johnstown. Early the next morning a consultation was held and it was decided that the situation was a dangerous one, that the immense amount of decomposing matter must be removed or its effects counteracted at once, that the Board should at once secure

quarters and put a force of men at work. In carrying out this order we encountered many difficulties.

Wherever buildings were left the material was piled fifteen or twenty feet high. In some localities, covering a number of acres, buildings were so jammed together that a passage was effected with great difficulty. In fact, the greater portion of the town site was one mass of débris, thrown together in such an inextricable net work as to almost forbid the contemplation of its removal. The survivors, a homeless, half crazed mass of humanity, seemed perfectly helpless and unable to give the Board the least assistance. All departments of their local governments were paralyzed. They were without protection from the lawless hordes that were pouring in from every section of the country. Chaos reigned supreme. Thousands of people, train after train of supplies, relief committees and gangs of volunteer workmen were constantly arriving. All formed a confused mass, every body trying to find some one else.

The day was spent in an almost fruitless effort to secure residents for clerks, time keepers and laborers. We were compelled to seek men wherever we could find them and it was not until late in the afternoon that we succeeded in securing a small force. These were at once put to work destroying dead animals, which were already becoming very offensive.

At this time no arrangement had been made to pay the men. There were no facilities for feeding and lodging a force. To provide food in a devastated valley for the twenty thousand survivors, the visitors and the rapidly gathering forces, making in all about thirty thousand people, was the question of the hour. We were embarrassed with difficulties at every turn. There was no use in trying to employ men unless we could at least furnish them with food and shelter. Another consultation was held and it was resolved to employ a force of carpenters and at once commence the erection of a camp and furnish the men with lodging and board to effect as soon as possible an organization of forces. This organization was not fully completed until the 8th, and that only by working night and day.

By the 5th of June fully six thousand men were at work in the valley. System and organization commenced taking the place of loose, ill-directed and spasmodic work. A city of tents and camps had sprung up to shelter the homeless. A large force were engaged in clearing away the great masses of wreckage and opening the streets. Here and there little patches of what were streets had been cleared. But so solidly packed was the mass of ruins at the stone bridge, that dynamite, derrick and human labor made little impression. Disinfectants were coming in by the car load; our hastily gathered forces were traveling back and forth over the wreck, seeking out the dead animals and burning them, and scattering disinfectants over all the masses of decompos-

ing organic matter. Horses, cows, dogs, cats and large quantities of meat and provisions were imbedded in the wreckage and mud. The work of extricating and removing them to a safe place to burn, entailed hours of not only disagreeable but excessively severe labor. The corps of sanitary inspectors went into the thick of the débris, and in a little while the bodies of fifty dead animals, mostly horses, were removed and burned.

The disinfecting crew went daily over and into the wreckage, in and out of ruined buildings and wherever they found a smell of decaying matter sought out the cause and disinfected it, reporting the same to the head office, when a gang was at once sent out to destroy it. During the first week an immense amount of decaying material was destroyed and large quantities of disinfectants used. But amid confusion, urgent demands and want of proper organization, no record of the amount of work performed could be kept. There is no way to compute the amount of animals destroyed by the sanitary corps. One foreman says that his force cremated nearly three hundred horses and that the total number of animals destroyed aggregate sixteen hundred. Mr. J. W. Parker, who, with a gang patroled the rivers up to Johnstown, reports that they burned over a hundred and fifty carcasses and about one hundred drift piles.

As soon as possible two circulars of information were published and distributed. The first assured the community that the Board was prepared to meet all the needs of the inhabitants of a sanitary nature promptly. It instructed them as to the best means of maintaining the present condition of general good health. The second was directed to the heads of families and recommended that women and children should leave the place for a few weeks, suggested that those living in over crowded houses would be better off in tents placed on the hillsides, and urged the imperative importance of cleaning the cellars of their houses of all mud and refuse, and of strewing them freely with disinfectants which would be furnished, without cost, by the Board. Nine health bulletins were published, from time to time, giving an exact statement of the condition of the public health, to allay any fears of an epidemic of disease. Circulars were also distributed telling the people how to clean up and to properly live in this emergency. A large amount of official pamphlets pertaining to the public health and giving information on the care of infants, and the treatment of infectious and contagious diseases, have been distributed at various periods. More than thirty thousand pages of printed matter have been distributed.

The people were prompt to act on any advice given by the Board, or its sanitary corps. They labored zealously to remove from their premises every vestige of the slime that the cruel flood buried them under.

A number of prominent physicians from other cities came as volunteers and did everything they could to assist in pushing forward the

sanitary work. They went back and forth over the entire length of the devastated district, directing the work and performing many arduous tasks with untiring zeal and energy.

The following volunteer physicians rendered efficient services for the sanitary corps of the Board:

Dr. P. M. Carrington, P. A. Surgeon United States Marine Hospital Service,

Dr. C. C. Probst, Secretary Ohio State Board of Health.

Dr. J. Allen Smith, University of Pennsylvania.

Dr. A. J. Graham, Peoria, Ill.

Dr. James McGrew, Pittsburgh, Pa.

Dr. Howard Fussell, Philadelphia.

Dr. F. W. Marvel, Atlantic City.

Dr. T. H. White, McKeesport, Pa.

Dr. Frank J. Phillips, Pittsburgh.

By the 8th of June, quarters had been erected for the accommodation of two hundred laborers. Manager, cooks, utensils and blankets were procured and our forces well in hand and doing effective work. Sheds were built to provide shelter for the teams and for the purpose of storing large quantities of disinfectants. Quarters secured for lodging and boarding the sanitary corps. In the same building were located the headquarters for disinfectants and offices for the clerical force.

June 8th a permanent organization of forces was completed. The medical inspectors were appointed and commissioned. System evolved out of chaos and the work greatly facilitated. The organization was as follows:

Dr. Benjamin Lee, Secretary and Executive Officer,

Dr. G. G. Groff, Member in charge at Johnstown,

Dr. R. L. Sibbet, Medical Inspector to the State Board of Health for the Cumberland district, Inspector at large,

Dr. S. M. Free, Medical Inspector to the State Board of Health for the Western Slope district, Inspector at large, in charge at Cambria city.

Sanitary Corps.

Dr. W. E. Matthews, Chief Medical Inspector.

Dr. George W. Wagoner, Deputy Medical Inspector, Kernville District.

Drs. W. B. Lowman and J. C. Sheridan, Deputy Medical Inspectors four wards of Johnstown.

Dr. B. F. Tomb, Deputy Medical Inspector, Morrellville district.

Dr. M. M. Cooper, Deputy Medical Inspector, Coopersdale district.

Dr. G. B. Porch, Deputy Medical Inspector, Cambria City district.

Dr. J. N. Pringle, Deputy Medical Inspector, Franklin and East Conemaugh district.

Dr. H. F. Tomb, Deputy Medical Inspector, Woodvale and Conemaugh district.

Dr. C. Sheridan, Inspector of Camps.

Dr. W. W. Walters, Inspector of Water Supply.

Dr. J. E. Silliman, [2d Brigade,] Inspector of morgues.

It will be seen by the above that the flooded valley, extending on the west from Coopersdale to East Conemaugh on the east, was divided into twelve districts, and a deputy medical inspector placed in charge and held responsible for the sanitary conditions of the same. The organization continued the same for about ten days, when the volunteers were compelled to relinquish their duties. In leaving they took with them the respect and gratitude of all who were benefited by their labors.

The clerical force at this time was as follows: In the executive office there were two clerks, in the office of the sanitary corps there were five clerks, and in the district there were six messengers. The other force consisted of about 248 laborers, 22 foremen and 4 cooks.

The work of deputy medical inspectors was to see and direct the work in their particular district, report daily to the executive officer the amount of work accomplished, and to offer any suggestions which they thought would facilitate the work in their districts. Each inspector was expected to make a daily round of his territory, reporting to this office everything discovered of an unsanitary character and directing the removal of all putrefying and decaying vegetable and animal matter; to establish headquarters where disinfectants, information and directions would reach him; to open sub stations for the distribution of disinfectants and circulars; and to put up placards at different points where disinfectants were distributed free of cost. Each inspector was furnished with gangs of men, with foreman over each, and under his direct command.

The history of the manner of working in one district will, in general, be the history of the operations in all. In some instances the demands were more urgent and required a large force for months to remove the immense masses of wreckage and material that harbored filth and was a dangerous source of disease. Some districts were swept with such violence that everything was carried away, and it required but a short time to render the locality habitable.

The character of the work necessitated the formation of gangs for doing certain kinds of labor. There were gangs with carts who gathered up the garbage and destroyed it; gangs of men who cleaned cellars and buildings of their flood deposits, where people were compelled to remain; a disinfecting gang to distribute the disinfectants and to use them whenever a body or carcass was being extricated; to disinfect the dumps, cellars and whatever or wherever there was thought to be a source of disease; a gang to gather old clothing, bedding and all matter of an offensive character and burn it. This offensive material

covered the whole valley to some extent, was found especially where there were piles of drift. Nearly everything that the water touched it ruined, and much that the people had undertaken to save was in a few days discarded and thrown out with the general wreckage. Each day's work averaged twenty-five wagon loads.

The foremen of laborers reported every evening to inspectors in charge and they in turn submitted a report to the chief medical inspector. The foreman of the disinfecting gang reported to the clerk in charge of disinfectants. All the inspectors and clerks submitted each night, a history of the day's work and called attention to such matters as necessitated orders from the Executive. The reports in connection with the large number of complaints received every day, were carefully read over and a plan of operations for the coming day decided upon. Orders were then made to cover every department of the work and instructions transmitted to the men in charge.

Hundreds of complaints came to the office every day, those needing immediate attention were at once referred to the inspector in charge of the district and an inspection ordered. These complaints usually called our attention to some existing nuisance, a request to clean a cellar, to inspect a building, yard or street, while others notified us of the finding of a body or a carcass.

There was a great need of public-water closets to accommodate the thousands that swarmed in the devastated districts. A force of carpenters was detailed for the purpose of erecting such conveniences and the work was continue until seventy-five public privies had been constructed. A special corps of men under a competent foreman was selected to disinfect these daily and to see that they were kept in proper condition. They also disinfected twenty-five closets erected by other forces. As these closets served their time and purpose they were removed, the vaults excavated and disinfected, and refilled with clean earth. At the time the state work closed there were in existence about twenty public closets.

A very large proportion of the survivors sought refuge among the residents on the higher ground skirting the flooded portion of the valley. These houses became very much crowded with the wretched people who carried with them from the general ruin flood-stained articles, and there was danger that these places would soon become permeated with the effluvia, and prove a source of epidemic. After fully considering the dangers, and desiring to know the condition of the people and their sanitary surroundings, it was thought best to have a canvass made of the whole district from Coopersdale to South Fork. This work was placed in the hands of the inspectors, extra inspectors being appointed to cover the ground not already included. These inspectors were instructed to proceed without delay to make a sanitary survey of their districts, reaching every house without exception; the survey to be re-

corded in blanks furnished for the purpose. They were to ascertain the name of the owner or tenant, number of street, number of rooms, number of families, males, females and children, and whether there had been any typhoid fever, diphtheria, or scarlet fever in the house within six months: to report the sanitary condition of cellars, living rooms, yard, privy, stable and surroundings; to make note of all facts bearing upon the health and comfort of the people; to abate all nuisances as they found them, and to carefully inform the people how to dispose of garbage and to use disinfectants.

The work was commenced on the 5th of June and completed in about ten days. In this canvass 2,687 houses were visited containing 13,712 rooms and a population of 18,602.

A large amount of valuable information was secured and used to excellent advantage in future operations. In the territory covered by the canvassers were many houses that had been vacated, being unsafe, or filled with mud and surrounded by piles of wreckage. In making use of the survey blanks only those houses were reported where people were living. In making a general report we make use of only a few of the figures secured.

While the average to a room is one and three-tenth, dwellings were often found that were overcrowded to a dangerous extent. The highest number found to a room was eight, but three and four to a room was quite a common thing.

The population, of the canvassed districts, before the flood was 26,326, the survey shows a decrease of 7,724. These figures do not represent the number lost in the flood, for during the ensuing two weeks a part of the population had sought shelter and food outside these limits.

The number of sick reported amounted to 195 cases. Of this number there were 54 cases of measles and 3 of diphtheria. No other contagious diseases were reported. There was almost a phenomenal absence of serious sickness. In Cambria City only two cases were reported in a population of 3,313. The district known as Prospect contained the largest number of sick to the population. Thirty-five cases to a population of 1,213. In the average of totals we find that in the whole valley about one per cent. reported sick. Fully fifty per cent. of the cases were minor troubles. Very few deaths occurred during the month following the disaster, except those that were directly effected by the flood, the result of exhaustion or injury. From this time until the close of our work, daily reports were required from the hospitals, inspectors and prominent physicians. In this manner we were able to tell exactly the condition of the public health.

The condition of the cellars of houses where people were living, was as follows: 481 in a very bad sanitary condition and 1,856 in good sanitary condition. These cellars were nearly all on the hillside and had good drainage. The water closets in the same localities, were as fol-

lows, 253 in a filthy condition, overflowing, 91 in a fair sanitary condition, 1,833 in a good sanitary condition and 87 that had been washed away leaving an open vault. Some of these were in the worst sanitary condition and the property owners were ordered to have them cleaned and disinfected.

The water supply is largely by hydrants. The water is brought from reservoirs located among the mountains, fed from small streams which run through uncultivated tracks of mountain land. The source of all the water supplied in this manner was carefully inspected. Water was taken from all the reservoirs and analized by Dr. Cresson, state analyst. The results were quite satisfactory. These reservoirs supplied 1,783 dwellings with water. Well water was used by 679 families, and spring water by 211 families. Some of the wells were found in an unsanitary condition and were condemned by the inspectors.

A brief sketch is now given of the various districts appointed to the deputy medical inspectors for the purpose of giving a general idea of the condition of each and the amount of work necessary to put them in a habitable condition.

At East Conemaugh the valley is narrow and the force of the water was most terrific. The water picked up a four-tracked railroad and miles of track covered with trains, freight and passengers, with shops and a stone-house, scattering them over miles of territory. The original channel of the river was filled up and a new one formed on the Franklin side. The topography of the place was wonderfully changed. The high banks on either side were sliced off and a number of squares carried with it. The bed of the river was widened some three hundred yards. Wherever the flood touched, it made a clean sweep and left nothing to endanger the public health. In the unflooded portions the dwellings became greatly crowded and the conditions unsanitary. Disinfectants were supplied and a number of nuisances ordered abated. The inspector for this district was soon discontinued.

In Woodvale borough everything was taken by the water except a portion of a mill and twenty-seven houses on the hillside. The population decreased from 1,347 to 345. A large proportion of the number constituting the decrease were drowned. The place could not have been left in a better sanitary condition. A deposit of three or four feet of clean sand covered the site. Imagination can hardly conceive that this was once the most beautiful suburb of Johnstown. The people brought to bear all the influence they could to have their streets opened, cellars cleaned and the river dyked. The sanitary conditions would not justify the lifting of a shovel and all the work performed by the state in the district, was the cleaning of two cellars to prove that there was not a trace of filth in the deposit.

Conemaugh Borough joins Woodvale on the south, and the part lying in the path of the flood suffered as badly, but in place of a deposit of

sand being left, most of the soil was taken and deep washouts occurred. A few squares, contiguous to Johnstown were badly wrecked and buried under immense masses of débris. This, after the survey was taken, was included in the Johnstown district and another inspector thus dispensed with.

Johnstown borough formed the centre of our operations and was by far the most important field of labor. This borough was divided into four districts. Doctors J. C. Sheridan and W. B. Lowman were in charge of the four wards lying in the peninsular-shaped point formed by the Stonycreek and Conemaugh rivers. This point is about half a mile wide at its widest part, and three-fourths of a mile long. Here were piled up the buildings and the dead, not only of Johnstown, but the greater part of what had been gathered by the flood in its sweep of the valley for twelve miles. A description of this tangled mass, piled from twenty to thirty feet high cannot be given. It was too great in extent to be comprehended. The population contained in these four wards before the flood amounted to 5,363. Two weeks later only 645 people were to be found and these were living in 92 houses.

Nearly the whole of this district was buried under the débris, and the greater part of the state work was expended here in opening miles of streets to create thoroughfares for the transportation of enormous masses of wreckage and filth, in opening and removing the huge and densely-packed drift at the stone bridge, in cleaning the river of accumulations to admit a free passage of sewage material, in excavating the filth from more than twelve hundred cellars and in cleaning as many yards of the filth laden mud. Considerably more than a thousand carcasses of dead animals were extricated and destroyed and over two thousand human bodies recovered. The removal of this deposit constituted a piece of work whose magnitude cannot well be appreciated, and which was marked daily, as it progressed, by the saddening discoveries of the remains of victims of the flood. Four months of time, thousands of men and hundreds of teams were required to accomplish the task.

The work of reducing the great drift at the stone bridge required nearly six week's work. Wedged down in the river bed were houses, immense logs, timbers, hundreds of miles of wire and the roots of trees, which formed almost a continuous net for some distance above the bridge, while cars and other large objects weighed down the débris from above. There were four gangs of men employed: those who with hooks pushed the small drift into the current; the axemen, who reduced the objects which were too large; the hoisters, whose engines hauled the greater obstructions upon the river bank to be burned, and the dynamiters. Seventeen thousand pounds of dynamite were used: as much as five hundred and forty pounds being discharged in single blasts. The work was accomplished by General Hastings' force. The whole

force working to exhume and clean up the ruined city numbered about six thousand men. At the cessation of our labors the whole force numbered about five hundred. During the four months, much the larger portion of the forces were at work in Johnstown borough.

The fifth and sixth wards of Johnstown are known as Kernville. Dr. Wagoner was the Deputy Medical Inspector in charge here. From his carefully compiled report the following facts are gleaned.

The district lies for one mile on the south side of Johnstown and of the Stonycreek river. Before the flood it was compactly built up with substantial dwelling houses which sheltered four thousand people. While this section of the city was outside the terrific torrent, it was traversed by the great return current which was deflected backward from the stone bridge, carrying with it an immense burden of débris from all parts of the flooded district and depositing it among the wrecked houses of Kernville. Twenty squares were under water to the depth of about nineteen feet. During the week preceding the establishment of the district offices, hundreds of laborers were employed clearing and burning the débris. One of the first acts of the office was to open a morgue. At this morgue one hundred and eighty-two bodies were prepared for burial.

Large quantities of disinfectants were taken away by the people and used, and still larger quantities were distributed by the office, from house to house at regular intervals. A gang was employed in sprinkling disinfectants over the entire district. Fifteen supply stations were established, and from these they worked so that they covered the entire district twice every week. A gang was detailed to gather up all filthy clothing, bedding, etc. Each day's work averaged twelve wagon loads. A number of men were kept on the dumps to disinfect them. People cleaning their own cellars and buildings deposited the filth on the street and alleys and it became necessary to remove these deposits and to clean out exceptionally filthy cellars. This work became a very important part of our operations.

Up to June 28th, a force of from forty to fifty men with teams, was employed. At this time the force was reduced one-half and again doubled on July 9th. July 23d the force was reduced to thirty men and August 24th the office was discontinued.

Upwards of fifty dead animals were destroyed, fifteen stores, meat markets and slaughter-houses cleaned, disinfected and rendered sanitary. Disinfectants were scattered regularly, and several squares cleaned that had not been touched by the contractors of the state.

In the seventh ward a number of streets were badly wrecked by the back water and a large amount of debris deposited. The work in this ward was directed by the Johnstown office.

Cambria city lies below Johnstown on the Conemaugh river and suffered greatly in loss of life and property. About one fourth was

almost completely wrecked and burid under the débris. The population before the flood was 2,902 and the decrease amounted to 689. The character of the work performed was similar to that of the other districts. The force employed was from twenty-five to five hundred men.

Morrellville and Coopersdale escaped with slight comparative loss. The authorities of these villages were instructed to clean their streets and order the people to have their cellars cleaned and disinfected. The work of the Board consisted in furnishing them with disinfectants.

There was not much wreckage scattered between Conemaugh and Mineral Point. The site on which stood the village of Mineral Point is now a dismal field of mud.

The United States Engineer Corps from Willet's Point, New York Harbor, arrived here on the 8th. The corps consisted, at first, of one hundred men, and they brought with them material for bridge and pontoon building. They erected five temporary bridges and two pontoons. This gave us means of transportation to all the districts and greatly aided us in the distribution of disinfectants and in making daily inspections. As the streets were opened and means of communication improved, the force was reduced, the districts enlarged and inspectors discontinued. The sanitary forces which had directed their efforts to recovering dead bodies, destroying animal and vegetable matter, and building and disinfecting public water closets, now gave their attention to the condition of the cellars, yards, alleys and streets. Hundreds of people were living over cellars and rooms filled with every imaginable kind of filth and were unable to clean them. Hundreds of cellars where buildings had been, now open and filled with a filth deposit, lined the streets--their owners absent, many of them never to return. In fact, very few property owners had sufficient available resources to pay for any work. To protect the public health it became necessary to condemn hundreds of cellars and have them cleaned. Although the work of cleaning cellars was largely done by the forces under General Hastings, and later, by Captain Hamilton, the demands were often such that we could not wait for them to take their regular course with the condemned ones. In many instances it was necessary to clean the first floor. In many of the houses over the cellars, cleaned by our little force, were sick people. Such cellars were thoroughly cleaned and disinfected. It was noticeable that the sickness decreased as the cellars were cleaned and the surroundings put in a sanitary condition.

The sanitary corps cleaned about two hundred, and General Hasting's force about three hundred cellars. After July 8th, Captain Hamilton's force cleaned more than seven hundred cellars, making in all about twelve hundred cellars cleaned by all the forces. During the last few weeks, after the streets had all been cleaned, Capt Hamilton placed the greater part of his force on this work.

Every cellar was carefully inspected and the whole territory gone over many times. Whenever a cellar was inspected and found to be in a bad sanitary condition it was condemned and reported to Captain Hamilton. Before the streets were opened the disinfecting had to be done by means of tin sprinkling cans. We had in use about four hundred, and thousands of gallons of disinfectants were sprinkled over the wreckage. After the streets were opened a street sprinkler was employed to disinfect the streets over which travelled the teams in the work of transporting the filth.

Late in the summer the water in the Stonycreek river became very low, and owing to the material deposited by the flood, there was not a proper outlet for the sewage. The condition was alarming.

The water had a small channel midway between the banks, the intervening space being filled up with a deposit from two to six feet of sand refuse and débris of all kinds, including railroad cars, bridges, trees, pieces of houses, and almost everything mentionable. A force of about five hundred men, under the direction of Captain Hamilton, Chief Engineer, devoted two weeks time to the opening of this water course. The work was all directed toward one object: The opening of the outlets of the sewers and the clearing away of the débris that prevented the sewage discharge from reaching the current of the stream. This necessitated, at the mouths of most of the sewers, the excavation of a drain from the sewer to the water.

On July 1st all the deputy medical inspectors were discontinued except two, Dr. Wagoner, with a small force, in the Kernville district and Dr. H. F. Tomb as general inspector. The principle work of the general inspector was to inspect cellars and to examine and report on the sanitary condition of all places complained of. From ten to twenty inspections were made daily. The force, including clerical service, previous to this date numbered about 285 men. July 1st the force was reduced about one half and the work of cleaning cellars given to the contractors and directed by the Chief Engineer.

The sanitary force was now as follows:

3 Medical Inspectors.
7 Clerks.
11 Foremen,
4 Cooks.
6 Messengers.
120 Laborers.
5 Two-horse teams.
2 One-horse teams.
18 Carts.
3 Saddle horses.

As the work was discontinued in some districts and the fields of operations grew narrow, the force was reduced until only a few men were

needed for disinfecting purposes. At a meeting of the board, September 27th, it was declared that the existence of a nuisance prejudicial to the public health in Johnstown and the Conemaugh valley had been so far removed that it was safe for the state to cease its sanitary operations in the district on the 30th day of September. It, therefore, withdrew its special supervision of the district on that date.

Disinfectants were lavishly used during the prosecution of the State work. In fact, but for the constant and unsparing application of these agents, the only recourse would have been a general conflagration. The amount of disinfectants used cannot be given as a complete record of these donated was not kept. A list of those disinfectants of which we have personal knowledge is given.

4000 barrels quick lime.
500 barrels chloride of lime.
1700 bottles bromine.
110 barrels Bullen's disinfectant.
100 tons of copperas.
100 gallons carbolic acid.
3 carboys muriatic acid.
180 barrels rosin.
200 barrels pine tar.
73 barrels pitch.
5 barrels liquid phenile.
15 barrels "Sanitas."
3 barrels "Phenique."
100 kegs "Utopia."
10 carboys embalming fluid.
720 bottles sodium hypochlorides.
700 bottles "Platt's Chlorides."
146 pounds corrosive sublimate.
100 Werther's disinfectants.
50 bottles P R. R. disinfectants.
100 bottles "Purity."
5 packages "Sanitaline."
100 bottles Bromo Chloralum.

A cargo of Quibell's disinfectants valued at $2500 and donated by Quibell Brothers, England.

Of the above disinfectants, the greater part has been used, there remaining not more than one-fortieth of the whole. The full amount of disinfectants applied cannot be comprehended from this list. Many of these disinfectants are highly concentrated chemicals and have to be greatly reduced before using. The number of gallons of liquid disinfectants used amounts to hundreds of thousands. The one thousand and seven hundred gallons of bromine made, when prepared 20,800 gallons.

Morgues were opened in the Pennsylvania Railroad passenger station,

Prospect school house, Millville school house, the Fourth ward school house, the Kernville school house, Grand View Cemetery chapel, Presbyterian church, Catholic church in Cambria, and a building in Morrellville. Nearly three thousand bodies were prepared for burial in these morgues. About 4500 coffins were sent to various morgues. Fully one sixth of those recovered had been so mangled, bruised or charred that indentification was impossible. The unidentified dead were buried wherever it was most convenient in no less than ten places. There were hundreds of these graves, and still each day increased the number.

A plot in Grand View Cemetery has been set apart and the work of interring the remains of all the unknown victims of the flood is being carried on by the State Flood Commission. When this work is completed every available means will then have been taken to render identification possible. The plot is located in one of the choicest sections of the cemetery, and provision will be made for the perpetual care of all the graves. One epitaph must do for all, and that is the word "Unknown."

A number of undertakers from Pittsburgh, with their assistants, had control of the morgues for some time, doing good work. On General Hasting's departure, our department took direct charge of the disposal of the dead. At this time all the morgues had been closed except the one at Millville. On assuming the control of this, we found that it could be conducted with a much less force, only a few bodies now being recovered daily. The reduction was effected early in July and Mr. John Henderson, an undertaker of Johnstown placed in charge. From this time until the close, the average number of bodies prepared was one a day. The highest number recovered in any one day being five.

It is remarkable that so little sickness and disease should follow so great a disaster. Very few deaths have occurred whose cause can be attributed to the flood. Following the flood there were a few deaths resulting from exhaustion and injury; a few cases of mental derangement and two suicides. As long as there was thought to be any danger of an epidemic we required the hospitals and practicing physicians to render a daily report of cases treated.

The only departure from the remarkably high standard of health which marked the period comprising the first three weeks after the flooding of the valley, was a tendency to diarrheal affections, often assuming the forms of cholera morbus. This almost general disturbance of the bowels was attributable to the intense heat succeeding an unusually low temperature, too free eating after the enforced rigid diet which prevailed for some weeks after the disaster, and the unusual exposure to the sun's rays, and the cold dampness which pervaded the place at night. In the meantime typhoid fever, originating at a farm house on the hills west of the town, made its way first into the village of Moxham, which escaped the flood, and thence into the flooded valley.

During the whole summer the cases of genuine typhoid fever did not aggregate one hundred. Many cases were reported which on examination were found to be of a malarial character, or what might be termed filth fever. All these cases were of a mild nature and in the majority of instances patients were convalescent in a few days. Few deaths occured from any variety of fever, the death rate not exceeding that of former years.

What has been termed filth fever is peculiar in its character and indigenous to this particular locality, the same type of fever having existed here previous to the flooding of the valley. This fever presents many of the characteristics of genuine typhoid fever while lacking some of the principal symptoms, the patient not experiencing any podromic period, but being taken sick suddenly, the fever of a high grade, remittent in character, scarcely ever intermittent, there being no chill, running its course, in many cases, in fourteen days. It leaves the patient in a weak and debilitated condition fully as serious as if he had suffered a month with genuine typhoid fever. The reports of the past few weeks show that its prevalence is decidedly decreasing.

Respectfully Submitted,

W. E. MATTHEWS M. D.
Chief Medical Inspector.

Compiled by M. E. BENNETT, *Chief Clerk.*

2.—REPORT OF DR. GEO. W. WAGONER, DEPUTY MEDICAL INSPECTOR FOR THE KERNVILLE DISTRICT.

JOHNSTOWN, PA., *September* 25, 1889.

DR. BENJAMIN LEE, *Secretary State Board of Health.*

DEAR SIR:—On the 8th of June, 1889 I was appointed a Deputy Medical Inspector of the State Board of Health by Dr. G. G. Groff, the member of the board then in charge of the sanitary work made necessary by the disastrous flood which swept the Conemaugh valley on May 31st, 1889.

The district assigned to me comprised the 5th and 6th wards of Johnstown borough and Grubbtown borough. This territory lies for one mile on the south side of Stony creek. It is a somewhat narrow strip of bottom land which ends abruptly at the sloping base of Kernville hill. Before the flood it was compactly built up with substantial dwelling houses which sheltered 4000 prosperous and happy people.

While this section of the valley was outside the terrific current that swept down the Conemaugh river, it was traversed by the great return current which was deflected backward by the Pennsylvania Railroad stone bridge. This return current carried with it an immense burden of débris from all parts of the flooded district and deposited it among the wrecked houses of Kernville. Twenty squares of the south side

were under water. On Morris street, at Joseph Morgan, Jr.'s residence, the water was 19 ft. 3 in. deep. After the waters subsided this extensive district was covered with a compact mass of débris, under which lay scores of dead, in the slum and filth that fell from the burdened waters.

During the week preceding the establishment of the district office of the State Board of Health, hundreds of laborers were employed clearing away and burning the débris. Many bodies were taken out of the wreck and prepared for burial at the corner of South and Napoleon streets. No morgue had been established, and these last sad duties were performed in the open air and in full view of the excited people. One of the first acts of the office was the opening of a morgue in a damaged house, where the dead were cared for in a decent and orderly manner away from the gaze of the curious. One hundred and eighty-two bodies were prepared for burial in this district. The district was liberally supplied with disinfectants and everything that could assist in pushing forward the sanitary work.

The force of laborers assigned to me, under the intelligent direction of Drs. Graham, McGrew, Phillips and Mr. Knode, traveled back and forth over the wrecks, seeking out the dead animals and burning them, and scattering disinfectants over all the masses of decomposing organic matter. These gentlemen being volunteers were soon compelled to relinquish their duties, but in leaving they took with them the respect and gratitude of all who were benefited by their labors.

A very large proportion of the survivors sought refuge among the residents on the high ground above Napoleon and South streets. These houses became very much crowded, and as all of the wretched people brought with them flood-stained articles from the general ruin, these places soon became permeated with the effluvia of the soiled goods. Canvassers were sent to each house to ascertain the number of people occupying it, the condition of their health, the condition of the house and its surroundings, and all facts bearing upon the health and comfort of the people. Directions were given in regard to the disposal of garbage, cleanliness about the house and yards, and all were invited to call at the office for disinfectants, where instructions were given as to their use.

Large quantities of disinfectants were taken away by the people and used, and still larger quantities were distributed by the office from house to house at regular intervals. During the entire time the office was open, one gang of laborers under the efficient direction of Carl Wakefield was employed in sprinkling disinfectants over the entire district. Fifteen supply stations were established, and from these they worked so that they covered the entire district twice each week. A gang was also detailed to gather up and burn the bedding, garments, and carpets which had been ruined by the water and were thickly scattered throughout

out the entire wreck. An immense quantity of this material was destroyed. Each day's work averaged twelve wagon loads.

I had occasion to protest against the contractors depositing the mud and filth taken from the streets, on the bank of the river, to narrow its channel, obstruct the flow of the water and clog up the outlets of the sewers. I advised that this material be deposited on a low, marshy place near the hill where the river had little or no bank, and where it would be useful in protecting the district from being flooded in times of high water. My efforts in this direction, during the time the greatest quantity of mud was removed, were without avail although repeated several times. A number of men were kept on the banks to disinfect this material as it was dumped. The people soon commenced to clean out their cellars and to deposit the filth on the streets and alleys. At first it did not seem to be the policy of the board to remove these masses but to leave them for the contractors. When the contractor's men had worked over a place they would not return to clean up any new deposits, and as the people cleaned their cellars when thev saw fit. it was not long before the streets had numerous piles of the most offensive mud scattered over them. It soon became a necessity for sanitary reasons to remove these deposits.. It was my judgment that the Board should not have waited for the impoverished people to clean out their own cellars, but having an anxious care for the people's health under such calamitous circumstances, should have undertaken this important work at once. It was not long, however until our force was allowed to remove the filth when deposited on the streets, and in some cases to clean out exceptionally filthy cellars. This formed a very important part of the work done on this side. I desire to say that none of this material removed under my supervison was deposited on the contracted banks of the river, but was hauled to the swamp where it could not add to the future danger of the residents of the South Side.

Up to June 28th there was a force of from forty to fifty men employed in the district doing sanitary work, together with the necessary teams. On that date the force was reduced one-half only to be doubled on July 9th.

On the latter date Dr. Lee allowed the force to be increased for the purpose of cleaning several squares which had not been touched by the contractors.

With a force averaging fifty-five men, five teams and ten carts this work was continued with excellent results together with the regular sanitary work.

After two weeks it was again deemed expedient to reduce the force and confine our work to disinfecting, and the removal of very offensive deposits. This work was done by a force of thirty men, until on August 10th it was decided that the necessity for special sanitary work no longer existed and the men were discharged. There were, however,

three laborers retained to scatter disinfectants, but on August 24th they passed from under my supervision by reason of the discontinuance of my commission. I can safely say that during these ten weeks a very large amount of absolutely necessary sanitary work was done in this district. Upwards of fifty dead animals were destroyed, some of them with great difficulty on account of their position in the wreck. Fifteen stores, meat markets and slaughter-houses were cleaned out and the decomposing contents destroyed. After the streets were cleaned out by the contractors they were kept clean by our force. Many of the alleys were cleaned first by our men and all were kept clean by them; disinfectants were scattered with regularity and system, house to house canvasses were frequently made to ascertain the condition of the people. A constant effort was made to do everything in the line of sanitary work that ought to be done.

With the concentration of 2500 people into 380 houses, all subjected to intense mental strain by reason of the calamity, and the radical changes in their habits of life, it is very gratifying to know that during the continuance of the Board's operations not a case of infectious disease developed in the district which could be attributed to bad sanitary conditions.

For this very gratifying result the citizens of the South Side have to thank the members of the State Board of Health, and particularly its executive officer, for the broad, liberal and scientific manner with which the calamity was viewed which rendered them helpless, and for the prompt action by which their stricken households were protected from the horrors of disease. As the misfortunes of the community were sudden and overwhelming in character, so was the sanitary relief prompt, energetic and thoroughly efficient.

The records of the central office show the quantity of disinfectants sent in to this district. I can only assure you that all of it was used with care.

I feel under very great personal obligation to you for the aid and advice given me while I was discharging the duties assigned to me. Whatever success has resulted from my work is due entirely to the generous manner in which you furnished the means to work with.

3—PRELIMINARY REPORT OF THE SECRETARY OF THE STATE BOARD OF HEALTH ON THE SANITARY CONDITION OF THE FLOODED REGIONS IN CAMBRIA, WESTMORELAND, INDIANA, ALLEGHENY AND BEAVER COUNTIES.

PITTSBURGH, *June* 7, 1889.

To His Excellency, James A. Beaver, Governor of the Commonwealth of Pennsylvania.

SIR:—I beg leave respectfully to report that at 4.30 p. m. Sunday, June 2d, I left Pittsburgh for Johnstown, accompanied by Dr. G. G.

Groff, a member of this Board, to inspect the flooded regions of the Conemaugh river. My primary object was to determine the extent of the danger of pollution of the Conemaugh, Kiskiminitas, Allegheny and Ohio rivers by the decomposition of dead bodies, whether those of human beings or domestic animals, and to reduce the danger within as narrow limits as possible. At Nineveh, I found one hundred and sixty-two dead bodies, which were being well and rapidly embalmed, and awaited the action of the coroner. I telegraphed him that where identification had taken place the interests of the public health would warrant dispensing with the usual formalities, if necessary for the expeditious removal of bodies. I ordered free use of disinfectants in and about the morgue. The work at this morgue was excellently done under Devore, Jr., of Pittsburgh. Seeing the urgent necessity for the employment of a large force of wreckers and searchers, at the earliest possible moment, I telegraphed the sheriffs of Allegheny, Westmoreland, Indiana and Cambria counties, instructing each to summon a large posse and proceed with the work of breaking up drift piles and exhuming bodies. I also telegraphed Adjutant General Hastings that I would report to him at Johnstown. Early the next morning, June 3d, we crossed the Conemaugh in a skiff to Old Nineveh where we found twenty-eight bodies, not prepared for transportation. I authorized Jno. Barber, justice of the peace, to hold an inquest, as nothing had been heard of the coroner, and instructed him that all bodies identified must be embalmed, all others wrapped in sheets soaked in disinfectant, and all not identified by 5 p. m. the following evening, buried; a careful description of body and belongings being kept and the graves marked. Left Dr. Riggs, of the Pennsylvania Railroad Company, in charge at Nineveh. Reached Morrellville at 10.30 a. m. and walked up to Johnstown. Reported in writing to General Hastings, not being able to find him personally. Crossed the river and reported to Mr. Moxham, chairman of the provisional committee, and advised him to order at once, through the Chamber of Commerce of Pittsburgh, five thousand pounds of copperas and two thousand five hundred pounds of chloride of lime, for immediate necessities. Made inspection of the entire borough of Johnstown, and of the Bedford street hospital. The work of cremation of dead animals, of disinfection of carcasses which cannot yet be extricated, of house to house inspection of inhabited houses, of cleaning and disinfecting such houses, and of instructing the people how to avoid disease as a result of the unusual conditions in which they are living, was at once inaugurated and is going on very systematically and efficiently, under the superintendence of Dr. Matthews, whom I have appointed chief of the sanitary corps. The comparatively small amount of sickness found by the inspectors, is sufficient evidence of the value of this work. I have, therefore, less fear of any serious epidemic in Johnstown. Its water supply is fortunately pure. Much, however, will depend on the

rapid destruction of débris and cleaning up of the place. For this a large number of men is needed.

The most pressing problem now before the Board, is the protection of the water supplies of cities on the rivers below. In order to render more efficient service in this matter, I came to Pittsburgh, June 6th, leaving Dr. Groff, whose sound judgment has been of the greatest assistance to me, in charge at Johnstown.

Here I am organizing gangs of wreckers to go up as far as Johnstown, and down as far as the State line, reclaiming all bodies and destroying all putrefying matter. There still remains a drift-heap of many acres in extent and many feet in depth, the greater part of it under water, which covers the Conemaugh river from the stone bridge of the Pennsylvania railroad up to the junction with the Stonycreek, and extends a considerable distance up the Stonycreek. This mass is jammed tightly against the bridge. The river flows under it, entirely concealed from sight. It is covered to a considerable extent with earth. To burn it as it stands would be an impossibility. It must contain some dead bodies of human beings and many carcasses. These are already putrefying and becoming offensive. Every day renders the situation more difficult and increases the contamination of the water.

I, therefore, after a careful personal inspection of the entire situation, by virtue of the authority conferred upon the State Board of Health, by the act of June 3d 1885, and delegated to me as its Executive Officer in Regulation I, declare the conditions existing at Johnstown and neighboring boroughs, and especially those of the drift-heap above described, and of the waters of the Conemaugh and Kiskiminitas rivers to constitute a nuisance dangerous to the public health, and, inasmuch as the extent of this nuisance is so great that the local authorities cannot abate it, I call upon your Excellency, as Chief Executive of the Commonwealth, to at once employ such force as may be necessary to remove and abate the same.

I have the honor to be
Your Excellency's most obedient servant,

BENJ'N LEE,
Secretary and Executive Officer, State Board of Health of Pennsylvania.

4.—ORGANIZATION DURING EARLY PERIOD OF OPERATIONS OF THE STATE BOARD OF HEALTH AT JOHNSTOWN.

BENJAMIN LEE, M. D., *Secretary and Executive Officer.*
GEORGE G. GROFF, M. D., *Member of the Board.*

Sanitary Corps of the State Board of Health

Chief Deputy Inspector.—Dr. W. E. Matthews.

Deputy Inspectors.—Dr. J. C. Sheridan, Johnstown, South; Dr. W. B. Lowman, Johnstown, North and Hornerstown; Dr. Geo. W. Wagoner, Grubbtown and Kernville; Dr. H. F. Tomb, Woodvale, Nineveh and Sang Hollow; Dr. Pringle, South Fork, Franklin, East Conemaugh and Mineral Point; Dr. Porch, Cambria city; Dr. B. F. Tomb, Morrellville and Sheridan; Dr. F. Schill, Walnut Grove and Moxham; Dr. E. L. Miller, Peelorville, Millville and Minersville; Dr. J. M. Cooper, Coopersdale and Tenacre.

Deputy Inspector of Camps. -Dr. C. Sheridan.

Clerk.—F. D. Jolly.

Manager of Disinfecting Stores.—E. T. Elder.

Time Keepers.—F. V. Robinson, W. H. Miller, W. E. Hanna and C. A. Harnish.

Foremen.—J. B. Kead, Geo. Knode, W. West, W. H. Brundage, F. T. Moser, C. C. Trevy, David Lavely, John Ainsworth, C. Heck, Jno. C. Devine, C. W. Beemer, Neton Devine, Dick Mapledoran.

Canvassers.—C. A. Matthews——Ehrgot and Geo. Helfrich.

In Charge of Disinfectants.—J. E. Sill.

Messengers.—Louis Zubrod, Willie Rauch, John McCann, Frank Peiking, Otto Fink, Henry Nickle, William Statler, George Smithborger, Fred Schubert, David H. Lavely, Albert Nickle, Earl Wakefield and Doyl Howard.

National Guard.

Chief of Operations.—General D. H. Hastings.

Aids—Colonel Thomas J. Hudson and Lieutenant Colonel Wm. J. Elliott.

Department of Public Safety.—General J. A. Wiley, Major Samuel Haslett, Major W. W. Greenland, Major Frank K. Patterson, Major Wilson T. Braden, Captain Geo. C. Hamilton and Captain Jas. D. Murdock.

Quartermaster's Department.—Colonel S. W. Hill and Lieutenant Colonel Thos. Potter, Jr.

Commissary Department.—Colonel J. Granville Leach, Lieutenant Colonel J. L. Spangler, Captain J. A. Loehr, Lieutenant W. H. Bean, Lieutenant J. P. Albro and Lieutenant Chas. E. Brown.

Receiving Depot Commonwealth, No. 1, Pennsylvania Railroad Depot.—Major Wm. J. Horn.

Receiving Depot No. 2, Baltimore and Ohio Depot.—Major J. S. Singer.

Surgeon General's Department.—Major J. E. Silliman.

Accounting Department.—Lieutenant Colonel J. H. Gray.

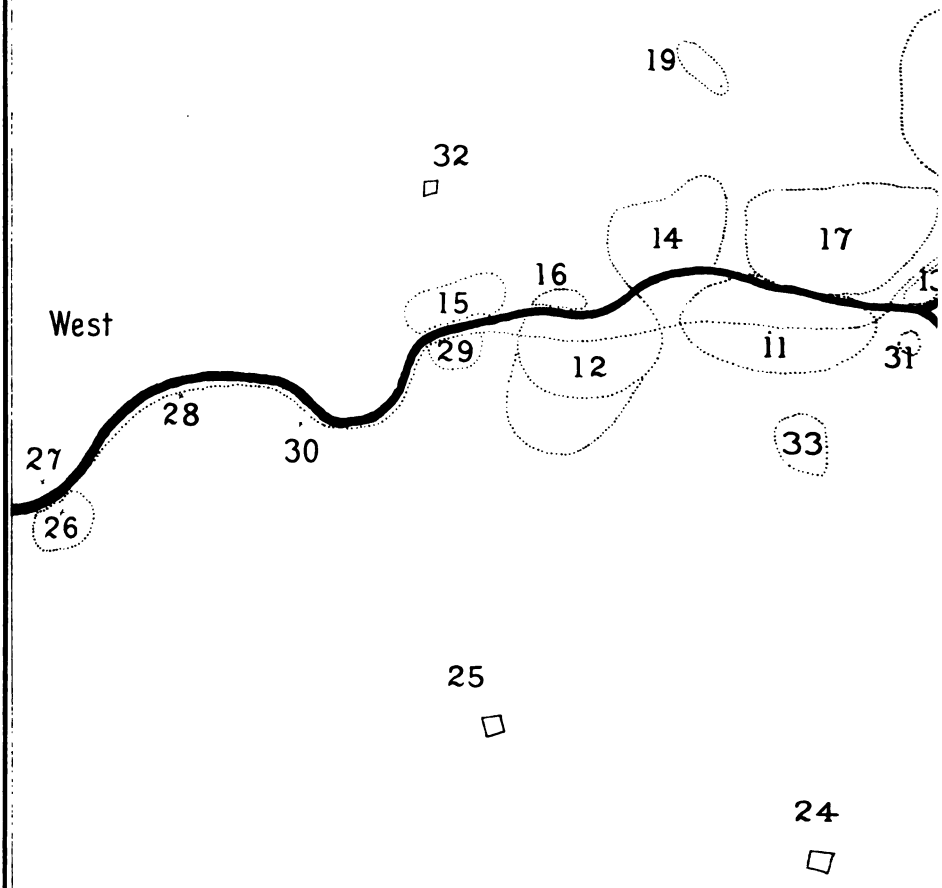
Bureau of Information.—Colonel John I. Rogers.

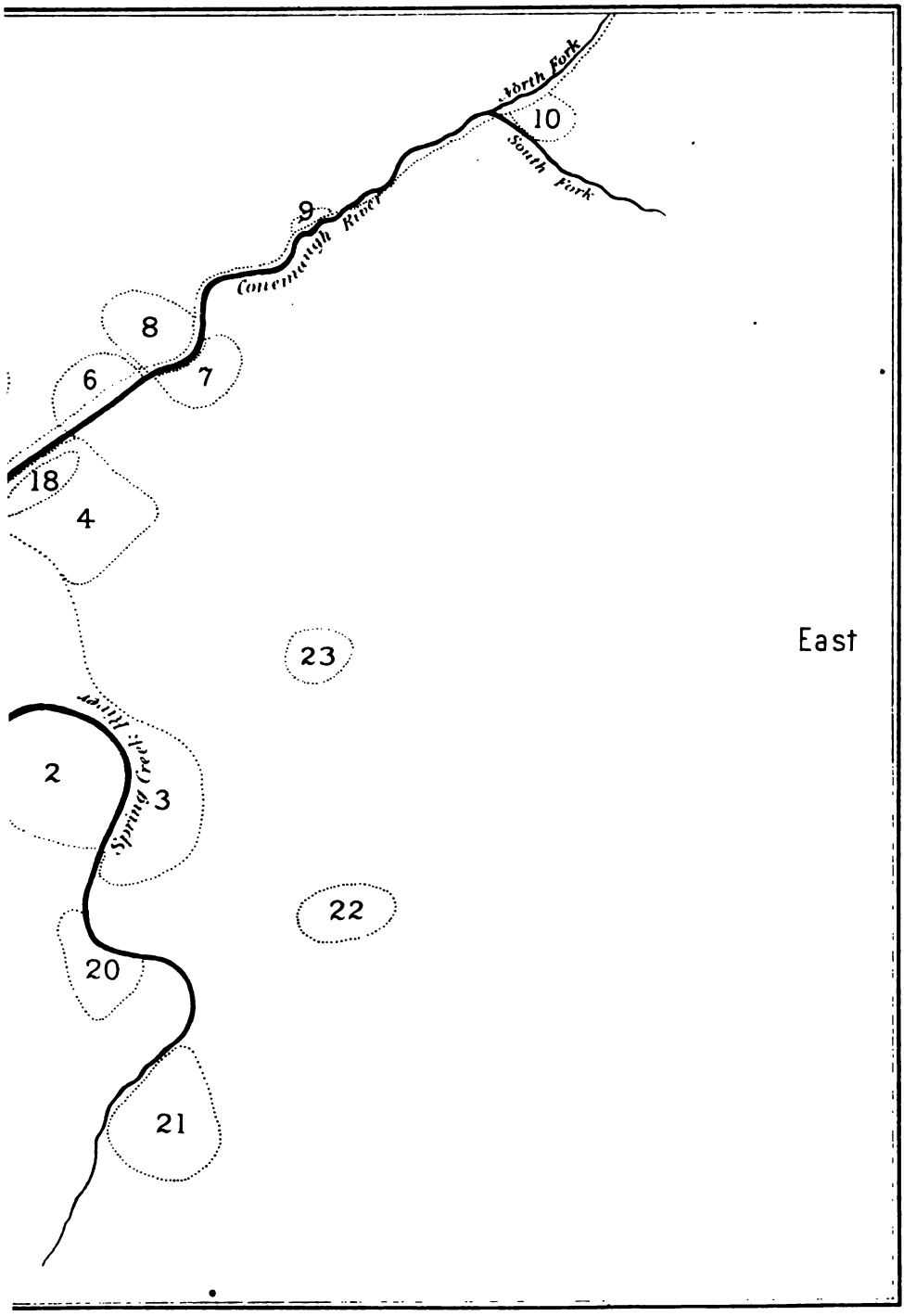
Distributing Department.—No. 8, Johnstown, Lieutenant J. M. Baker and Lieutenant Geo. R. Burnett; No. 9, Kernville and Grubbtown, Major A. Curtin; No. 10 Conemaugh borough, Lieutenant S. H. Williams.

Labor Dist

First District.—All territory below Stone — as. McKnight.
Second District.—Territory about Ston — M. Phillips.
Third District.— — or J. W.
Coburn & Co.

Chart of Johnstown and Vicinity.




North Fork
South Fork
Conemaugh River
Spring Creek
10
9
8
7
6
18
4
23
2
3
22
20
21
East

Fourth District.—Territory above Franklin Street, Contractor McLane & Co. and Engineer H. F. Lofland.

Fifth District.—Upper section, Contractor Jas. McKnight and Engineer Eugene Cunningham, Lower section, Contractor Patrick Ridge and Engineer Eugene Cunningham.

General Engineer.—Colonel H. T. Douglass.

Headquarters, at private car, Newark on Baltimore and Ohio tracks.

Key to Chart of Johnstown.

1. Johnstown, First, Second, Third and Fourth wards, population, ... 5,363
2. Kernville, Fifth and Sixth wards of Johnstown, population, ... 3,452
3. Hornerstown, Seventh ward of Johnstown, population, ... 2,417
4. Conemaugh borough, First and Second wards, population, ... 3,971
5. Prospect, population, ... 810
6. Woodvale, population, ... 1,247
7. Franklin, population, ... 672
8. East Conemaugh, population, ... 1,074
9. Mineral Point, population, estimated, ... 150
10. South Fork, population, estimated, ... 700
11. Cambria City, population, ... 2,902
12. Morrellville, population, ... 2,201
13. Millville, population, ... 2,680
14. Minersville, Second ward of Millville, population included.
15. Coopersdale, population, ... 573
16. Tenacre, only 5 or 6 houses.
17. Cambria Iron Works.
18. Gautier Steel Department.
19. Rosedale, population, ... 311
20. Grubbtown, population, ... 497
21. Moxham, population, ... 293
22. Walnut Grove, population, ... 375
23. Daisytown, population, estimated, ... 175
24. Millcreek Dam, water supply for Johnstown.
25. St. Clair Dam, water supply for Johnstown.
26. Nineveh, population, estimated, ... 300
27. Old Nineveh, population, only 5 or 6 houses.
28. Conemaugh Furnace, only 3 or 4 houses.
29. Sheridan, population, estimated, ... 40
30. Sang Hollow, only 4 or 5 houses.
31. Stone Bridge, scene of the great gorge.
32. Wild Cat Dam, water supply of Johnstown.
33. Brownstown, population, ... 287

5.—ORDERS AND TELEGRAMS SENT FROM NINEVEH, JUNE 2D.

(a). *Telegram to Sheriff's*

NINEVEH, *June 2d.*

To the Sheriff of————county.

The State Board of Health hereby directs and empowers you to immediately summon a posse to patrol the Conemaugh river, tear down the drift heaps and remove the dead bodies, both of human beings and of domestic animals.

This is absolutely necessary to protect your county from pestilence.

BENJAMIN LEE,

Secretary and Executive Officer State Board of Health.

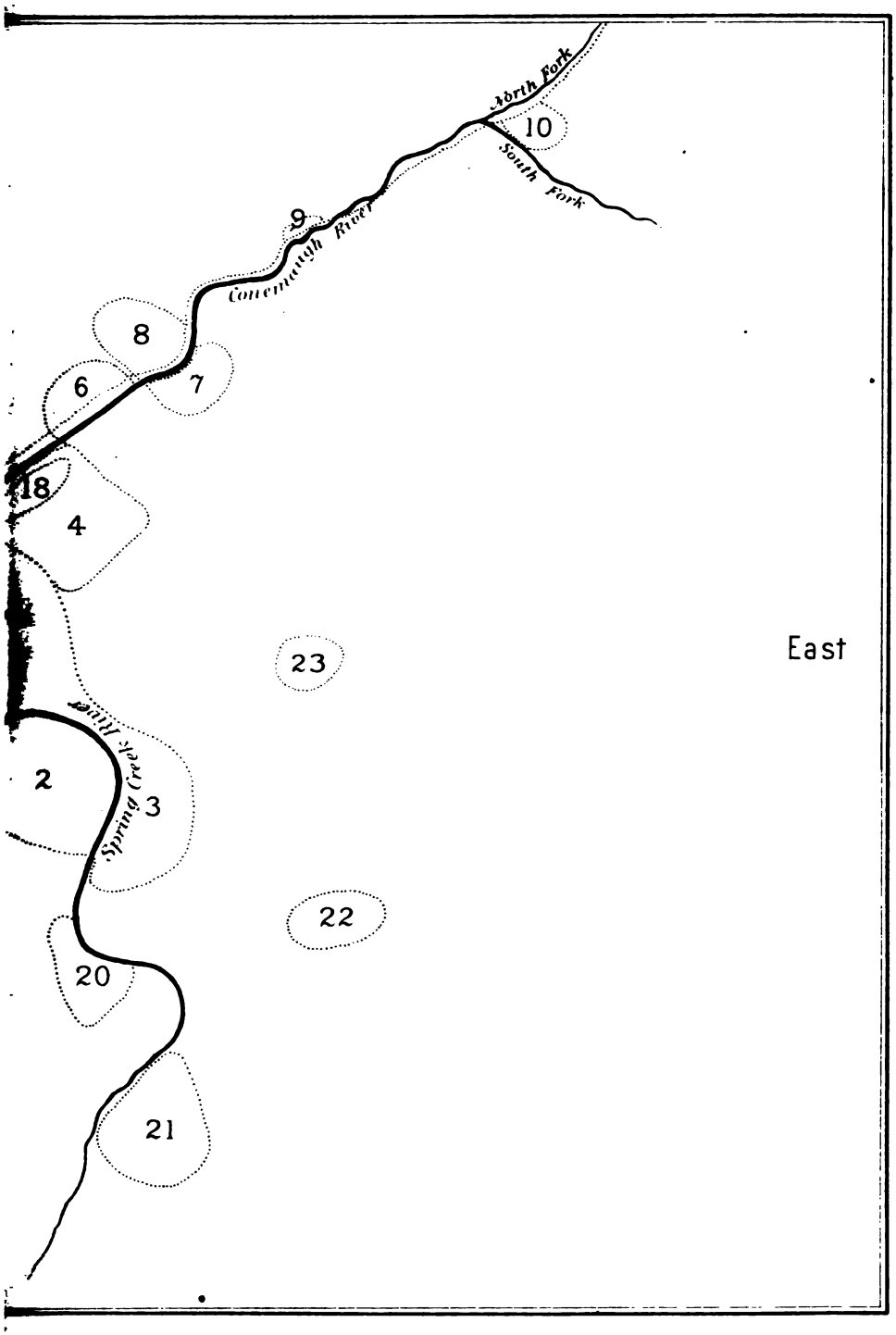
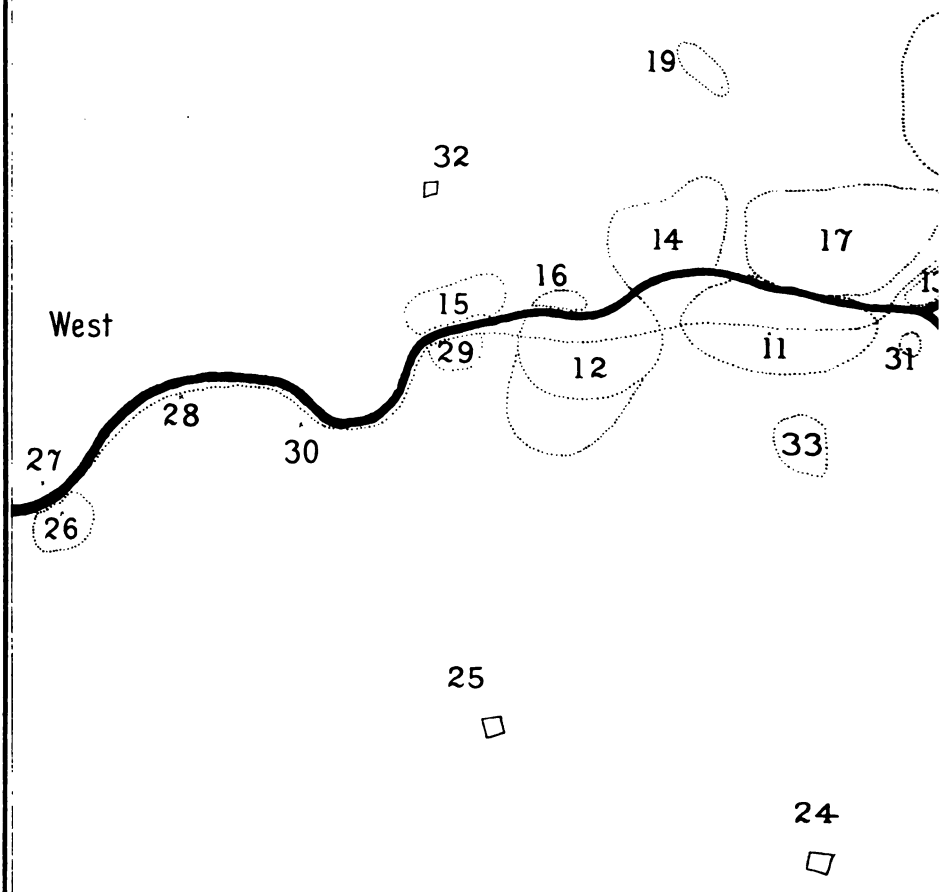
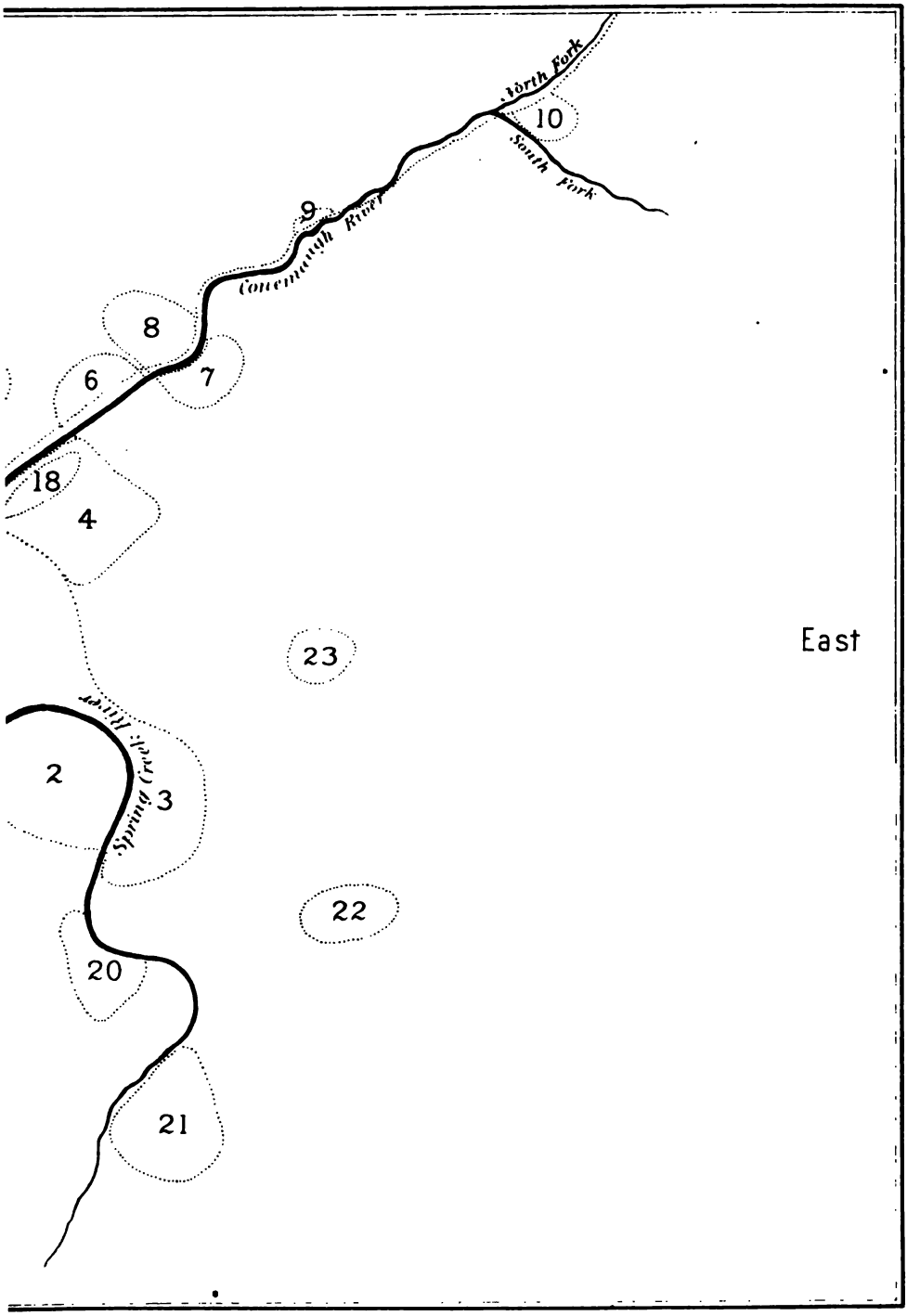

North Fork
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Chart of Johnstown and Vicinity.




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Spring Creek
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3
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20
21

(b.) *To the Superintendent Pennsylvania Railroad Company, Pittsburgh.*

A strong force of laborers under competent bosses is needed in the neighborhood of Nineveh to tear down drift heaps, and discover dead bodies of human beings and domestic animals.

The condition here is extremely pressing.

BENJAMIN LEE,
Secretary State Board of Health.

(c.) *Telegram to General D. H. Hastings, Adjutant General, Johnstown.*

I am here with Dr. Groff of our Board. One hundred and sixty-two bodies are here awaiting identification. A strong force is needed to recover bodies and tear down drift heaps. Will be with you in the morning.

BENJAMIN LEE,
Secretary State Board of Health.

(d.) *Communication to the Coroner of Westmoreland County.*

NINEVEH, *June* 2*d* 1889.

Dr. Hammer, coroner of Westmoreland county.

DEAR SIR.—The interests of the public health demand that the accumulation of dead bodies at this point should be diminished as rapidly as possible. The emergency is such that some of the formalities usual in cases of persons found drowned might very properly be waived.

You are therefore hereby empowered and instructed so to modify your usual plan of proceedure as to permit bodies to be removed immediately upon identification.

By order of the State Board of Health.

BENJAMIN LEE, M. D.,
Secretary and Executive Officer.

6.—TELEGRAM TO GOVERNOR BEAVER.

PITTSBURGH, PA., *June* 3, 1889.

His Excellency James A. Beaver, Governor of Pennsylvania.

Dr Lee and myself arrived at scene of Johnstown disaster Sunday. Dr. Lee served sheriffs of counties bordering the Conemaugh and Alleghany rivers as follows.

Dr. Lee is now at Johnstown using every means to prevent any epidemic from putrescent matter.

GEORGE. G. GROFF.

7.—TELEGRAMS FROM JOHN B. HAMILTON, SUPERVISING SURGEON GENERAL U. S M. HOSPITAL SERVICE.

WASHINGTON, D. C , *June* 4, '89.

(a.) *Dr Benjamin Lee, Secretary State Board of Health, Johnstown.*

The Bureau is ready to render any aid in its power, if you desire it. I have ordered Dr. Carrington from Pittsburg, and he will confer with you. You may retain him for a few days if you need his service: otherwise he will regain his station after reporting.

(Signed) HAMILTON, *Surgeon General.*

WASHINGTON, D. C., *June* 5, 1889.

Dr. Benjamin Lee, Secretary State Board of Health, Johnstown, Pa.

Have shipped copperas and bichloride of mercury all available in town to-day and send more from Baltimore this afternoon. It is suggested by the President who is much interested in the matter that the temporary depopulation of Johnstown be encouraged as much as possible.

HAMILTON, *Surgeon General.*

8.—ORDERS FROM J. B. SCOTT, DIRECTOR.

James McMillan (Plumber).

Please co-operate with Dr. Lee of Board of Health in having teams remove recovered bodies.

JAMES B. SCOTT, *Director.*

June 5, 1889.

Pass men in charge of Board of Health. These men will wear cap and badge.

JAMES B. SCOTT, *Director.*

9. AUTHORITY TO OBTAIN DISINFECTING UTENSILS.

(a.) *Order by the Secretary.*

JOHNSTOWN, *June* 5, 1889.

The bearer is hereby authorized to enter any hardware or furnishing store and select such articles as may be useful for handling and transporting disinfectants, and for the work of disinfection. All articles thus appropriated will be noted and paid for.

BENJAMIN LEE, M. D.,
Secretary State Board of Health.

(b.) *Memorandum of articles obtained for Sanitary Purposes.*

From Clark's cheap store, Main street.

10 tin coffee pots.

4 pairs suspenders.

From Thomas and Co., Main Street.
1½ dozen paper buckets.
1½ dozen wooden buckets.
From Standard Store, 219 Main Street
5 tin coffee pots.
1 tin watering pot.

10. TELEGRAM FROM THE SECRETARY OF THE STATE BOARD OF HEALTH OF OHIO.

COLUMBUS, OHIO, *June* 6th, 1889.

Dr. Benj. Lee, Secretary State Board of Health, Hotel Anderson, Pittsburgh.

Received despatches from Pittsburgh stating dead animals in large numbers are being turned in river above that point greatly endangering Ohio river, can you prevent it. I will come if necessary, answer.

C. C. PROBST, *Secretary.*

11.—OFFER OF SERVICES FROM MAJOR M. VEALE, LATE HEALTH OFFICER OF PHILADELPHIA.

727 WALNUT STREET,
PHILADELPHIA, PA., *June* 6, 1889.

Dr. B. Lee, Secretary State Board of Health.

DEAR SIR:—If I can be of any assistance to you in Johnstown, write or telegraph me, and I will come on at once.

Yours very truly,
M. VEALE,
Late Health Officer, Philadelphia.

12.—COPY OF LETTER FROM SUPERVISING SURGEON-GENERAL HAMILTON.
OFFICE OF THE SUPERVISING SURGEON-GENERAL.

U. S. MARINE-HOSPITAL SERVICE,
WASHINGTON, *June* 13, 1889.

Dr. Benjamin Lee, Secretary State Board of Health, Johnstown, Pa.

SIR:—I have the honor to inform you that according to your request, I shipped 16½ pounds of corrosive sublimate from Washington on the 8th of June, and on the same day there were shipped in one box containing 100 pounds from Baltimore. Also from Baltimore 25 bbls. of copperas—7690 pounds in all, being the crude disinfectants asked for.*

Respectfully yours,
JOHN B. HAMILTON,
Supervising Surgeon-General, M. H. S.

* These supplies have been paid for by the citizens relief association here—J. B. H.

13—PROTECTION OF WATER SUPPLY.

(a.) *Report of Inspection, by Drs. Probst and Carrington.*

JOHNSTOWN, PA., *June* 10, 1889.

State Board of Health.

GENTLEMEN:—We would respectfully report as follows on the water supply of Johnstown and vicinity:

Johnstown and Kernville have two sources of supply—Mill creek dam, located five miles from the former place on a branch of Stony-creek, and St. Clair reservoir, located on a branch of the Conemaugh, two and one half miles from Johnstown.

The purity of these waters is beyond question, and the supply is abundant. The arrangement of pipes is such that either or both sources of supply can be utilized.

There are but few wells in Johnstown, and these are on the heights above the city.

Commencing above, East Conemaugh is supplied almost entirely by wells which were mostly in good condition. A small portion of the village was formerly supplied from Conemaugh dam; this is now destroyed.

But little sickness and no contagious diseases reported there. Prospect and Millville are supplied from Wildcat dam, located several miles back in the hills.

Conemaugh borough partakes of the general supply of Johnstown, but owing to leakage and low pressure, hydrants on high grounds are not flowing. Residents of this section get water from wells, and hydrants lower down. These wells were not affected by the flood. The work of repairing broken water pipes is progressing rapidly, and these families will soon have a sufficient supply of pure water.

This report covers the territory surveyed to-day, and we are convinced the water supply is as pure as before the flood. We would add, that our inquiries in these districts showed that but little sickness and no cases of contagious diseases were to be found.

P. M. CARRINGTON, M. D.,
P. A. Surgeon United States Marine Hospital Service.
C. O. PROBST, M. D.,
Secretary Ohio State Board of Health.

APPENDIX.

Messenger for Water Company says that the supply is gaining during the past three days, and their Mill creek reservoir is running over.

The company are supplying all parts of town at present, except in the lower portion of Main street, and on the point. No danger is at all anticipated. All water comes from a distance from the flooded districts.

Report to day from the other reservoirs, which at last accounts, were

holding their own. They ask that all pipes be hammered shut to stop the outflow.

(b.) *Analyses.*

Doctor P. M. Carrington.

DEAR DOCTOR:— (1) You are instructed to procure a sample of water at the Pennsylvania stone bridge, and to seal and label it No. 1.

(2) To procure a sample of water at a hydrant in Johnstown, seal and label it No. 2.

(3) To procure a sample of water, at the 6th street bridge, Pittsburg, seal and label it No. 3.

(4) These samples to be delivered to a chemist in Pittsburgh for analysis, and his report furnished me.

G. G. GROFF.

PITTSBURGH, Pa., *June* 19, 1889.

I hereby certify that the within instructions were followed: the samples 1, 2, 3, being collected from the localities specified. Sealed and delivered to Messrs. Hunt & Clapp, chemists, whose report is forwarded herewith.

P. M. CARRINGTON, M. D.
P. A. Surgeon, M. H. S.

Pittsburgh Testing Laboratory.

PITTSBURG, PA., *June 18, 1889.*

Analysis of water. Sample marked No. 1. Received from Pennsylvania State Board of Health, per Dr. P. M. Carrington, 423 Wood street, city. Received at Laboratory June 14, 1889.

		Grains per gallon.
Total solids,		4.55
Volatile organic matter,	2.69	
Fixed solids,	1.86	
Chlorine,		0.39
Sulphates,		0.48
		Parts per 100,000.
Nitrates,		0.431
Free ammonia,		0.011
Albumenoid ammonia,		0.021

HUNT & CLAPP.

PITTSBURGH, PA., *June 18, 1889.*

Analysis of water. Sample marked No. 2. Received from Pennsylvania State Board of Health, per Dr. P. M. Carrington, 423 Wood street, city. Received at Laboratory. June 14, 1889.

		Grains per gallon.
Total solids,		2.28
Volatile organic matter,	1.81	
Fixed solids,	47	

Chlorine,	0.81
Sulphates,	0.25
	Parts per 100,000.
Nitrates,	0.362
Free ammonia,	0.042
Albumenoid ammonia,	0.024

HUNT & CLAPP.

PITTSBURGH, PA., *June 18, 1889.*

Analysis of water. Sample marked No. 3. Received from Pennsylvania State Board of Health, per Dr. P. M. Carrington, 425 Wood street, city. Received at Laboratory June 14, 1889.

		Grains per gallon.
Total solids,		4.61
Volatile organic matter,	3.03	
Fixed solids,	1.58	
Chlorine,		0.55
Sulphates,		0.38
		Parts per 100,000
Nitrates,		0.524
Free ammonia,		0.005
Albumenoid ammonia,		0.027

HUNT & CLAPP.

PITTSBURGH, PA., *June* 19, 1889.

Dr. Benj. Lee, Secretary Pennsylvania State Board of Health, Johnstown, Pa.

DEAR DOCTOR:—I enclose the report of analysis of three samples of water received this day from Messrs. Hunt & Clapp, chemists, together with my certificate as to source of samples. I enclose also a list of articles taken for sanitary purposes from stores on Main street, Johnstown.

Very truly yours,
P. M. CARRINGTON,
P. A. Surgeon U. S. M. H. S.

(c.) *Communication to the President of the Johnstown Water Company.*

STATE BOARD OF HEALTH,
JOHNSTOWN, *July* 10, 1889.

Mr. J. C. McMillan, President Johnstown Water Company.

DEAR SIR:—I yesterday, in company with Dr. George Wagoner, one of my medical inspectors, made a careful inspection of the Mill creek dam, and of the stream above the dam on both sides of the road. I have to call your attention to the following facts which are of most serious import as regards the lives and health of your citizens. First. At the last flood, about eight days ago, the water was so high as to deposit heavy débris on the top of the dam breast. Half an inch

more would have carried the water over. Six inches more would have seriously impaired the strength of the embankment, even if it did not carry away the dam, and reproduce the South Fork disaster, on a small scale. I would strongly advise raising the dam two feet during the present summer and widening the sluice way two feet as well. Secondly, I found a large number of cattle pasturing in the Cambria Iron Company's enclosure just above the dam, and an almost equal number, above the road on the hill sides, some of them coming from Westmoreland and Indiana counties. I have to request that within twenty-four hours, all the cattle in the Cambria Iron Company's enclosure be removed, and that all persons pasturing cattle above the road, be instructed to remove them at once, so that they cannot obtain access to the stream. Analysis shows pollution of the water from this source, and the prevalence of diarrhea, cholera morbus and dysentery to a daily increasing extent, makes it absolutely necessary that this pollution should cease. I put this in the form of a request, feeling certain that you only need to be put in possession of the facts to feel as strongly as I do myself, the necessity for immediate action to check this threatened epidemic.

I have the honor to be, dear sir,

Yours very respectfully,

BENJ. LEE, *Secretary.*

JOHNSTOWN, *August* 3, 1889.

Mr. James McMillen, President Johnstown Water Company,

DEAR SIR:—The continued development of serious cases of disorders of the bowels in Peelorville make me feel anxious. I send Mr. Mathers this morning a communication with reference to foul and overflowing privies on Prospect Hill. These should have immediate attention. I have just returned from an inspection of the tank which supplies this village. I find the roof rotted and a large hole through it. Also many knot holes in the sides through which boys could introduce filth. It occurs to me that the building should be protected by a high fence. The worst feature, however, is a large pond of stagnant water a few feet from the tank, in which are floating a dead dog and several pieces of decaying meat If there is the slightest leak in the wall of the tank, poisonous material will surely reach it from this pond. There has been a drain which has become filled up. This could easily be opened up again, and the pond emptied, and I suggest this as a step of much importance.

I have the honor to be,

Yours respectfully

BENJ. LEE, *Secretary.*

JOHNSTOWN, Pa., *August* 5, 1889.

Mr. James McMillen, President Johnstown Water Company.

DEAR SIR:—I have reason to think that a considerable number of cattle and horses are still pasturing on the banks of Mill creek, and not far from the reservoir. Typhoid fever is on the increase in town, and every precaution should be taken to keep the water absolutely free from pollution.

Yours very truly

BENJ. LEE, *Secretary.*

(d.) *Analyses.*

PHILADELPHIA, *August* 10, 1889.

Dr. Benj. Lee, Secretary State Board of Health.

DEAR SIR:—I have delayed sending the certificates of analysis of the Johnstown and Wilkesbarre waters, hoping to see you meanwhile.

I have obtained specimens of typhoid bacillus from all but No. 6079, hydrant, Prospect Hill, and No. 6080, Franklin street, near Main street.

These waters gave a remarkably clear record by chemical tests, but long manipulation secured two or three typhoid bacilli from each of the samples noted as containing cesspool drainage.

Very truly yours,

CHARLES M. CRESSON, M. D.

*Analysis of water from spring water at Moxham, two and a-half miles south of Johnstown, Pa. Analysis made July 27–Aug. 3, 1889, by Charles M. Cresson, M. D. Sample received July 27, 1889. * Amount of sample five-eighths U. S. G. Condition of sample, clear. Reaction, neutral.*

ANALYSIS No. 6,076.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	0.1248	35.414	2.139
Ammonia, free (NH_3),	Trace.	Trace.	Trace.
Ammonia, albumenoid,	0.0008	0.1143	0.0137
Nitrogen from nitrates and nitrites,	0.0600	8.5680	1.0280

Anal. No. 6,076.—The chemical examination of this water does not discover the presence of any material amount of hurtful matter, but the microscope distinctly shows the presence of cesspool drainage, of such character as condemns it absolutely for drinking purposes.

CHARLES M. CRESSON, M. D.

*One U. S. gallon contains 231 cubic inches, 8·332898 pounds.

*Analysis of water from hydrant on Prospect Hill, Johnstown, Pa., marked No. 2. Analysis made July 29–Aug. 5. 1889, by Charles M. Cresson, M. D. Sample received July 29, 1889. *Amount of sample, five-eighths U. S. G. Reaction, faintly alkaline.*

ANALYSIS No. 6,079.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	0.1664	23.761	2.852
Ammonia, free (NH_3),	0.0016	0.228	0.027
Ammonia, albumenoid,	0.0016	0.228	0.027
Nitrogen from nitrates and nitrites,	Trace.	Trace.	Trace.

Anal. No. 6,079.—The chemical examination of this water does not disclose the presence of any material amount of hurtful matter.

CHARLES M. CRESSON, M. D.

*Analysis of water from Franklin street, near Main, central part of Johnstown, Pa. Analysis made July 29–Aug. 5, 1889, by Charles M. Cresson, M. D. Sample received July 29, 1889. *Amount of sample, five-eighths U. S. G. Reaction, faintly acid.*

ANALYSIS No. 6,080.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	0.2080	29.702	3.565
Ammonia, free (NH_3),	None.	None.	None.
Ammonia, albumenoid,	0.0008	0.1143	0.0137
Nitrogen from nitrates and nitrites,	Trace.	Trace.	Trace.

Anal. No. 6,080.—The chemical examination of this water does not discover the presence of any material amount of hurtful matter.

CHARLES M. CRESSON, M. D.

*One U. S. gallon contains 231 cubic inches, or 8·332698 pounds.

*Analysis of water from Cambria City hydrant, 1 mile west of Johnstown, Pa., marked No. 4. Analysis made July 29–Aug. 5, by Charles M. Cresson, M. D. Sample received July 29, 1889. *Amount of sample, five-eighths U. S. G. Reaction, neutral.*

ANALYSIS No. 6,081.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000
Chlorine in combination,	0.1664	23.761	2.852
Ammonia, free (NH_3),	0.0008	0.1143	0.0137
Ammonia, albumenoid,	0.0008	0.1143	0.0137
Nitrogen from nitrates and nitrites,	Trace.	Trace.	Trace.

Anal. No. 6,081.—The chemical examination of this water does not discover the presence of any material amount of hurtful matter, but the microscope distinctly shows the presence of cesspool drainage of such character as condemns it absolutely for drinking purposes.

CHARLES M. CRESSON, M. D.

*Analysis of water from Mill Creek Reservoir, four and a-half miles southwest of Johnstown, marked No. 5. Analysis made July 31–Aug. 7, 1889, by Charles M. Cresson, M. D. Sample received July 3, 1889. *Amount of sample, five-eighths U. S. G. Condition of sample, clear. Reaction, faintly alkaline.*

ANALYSIS No. 6,097.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000.
Chlorine in combination,	0.1248	35.414	2.139
Ammonia, free (NH_3),	Trace.	Trace.	Trace.
Ammonia, albumenoid,	0.0016	0.228	0.027
Nitrogen from nitrates and nitrites,	Trace.	Trace.	Trace.

Anal. No. 6,097.—The chemical examination of this water does not discover the presence of any material amount of hurtful matter, but the microscope distinctly shows the presence of cesspool drainage, of such character as condemns it absolutely for drinking purposes.

CHARLES M. CRESSON, M. D.

*One U. S. gallon contains 231 cubic inches, or 8·332698 pounds.

*Analysis of water from St. Clair Reservoir, thirty feet from shore, Johnstown, Pa., marked No. 6. Analysis made July 21–Aug. 7, 1889, by Charles M. Cresson, M. D. Sample received July 31, 1889. *Amount of sample, five-eighths U. S. G. Reaction, faintly alkaline.*

ANALYSIS No. 6,098.	Grains in one U. S. gallon.	Pounds in 1,000,000 U. S. gallons.	Parts in 1,000,000
Chlorine in combination,	0.0832	11.880	1.4270
Ammonia, free (NH_3),	0.0008	0.1143	0.0137
Ammonia, albumenoid,	0.0016	0.2280	0.0270
Nitrogen from nitrates and nitrites,	Trace.	Trace.	Trace.

Anal. No. 6,098.—The chemical examination of this water does not discover the presence of any material amount of hurtful matter, but the microscope distinctly shows the presence of cesspool drainage of such character as condemns it absolutely for drinking purposes.

CHARLES M. CRESSON, M. D.

14.—CONTRIBUTION OF DISINFECTANTS FROM MESSRS. QUIBELL BROS.

(a.) *Telegram from Office of Supervising Surgeon General Hamilton.*

WASHINGTON, D. C., *June* 9, 1889.

DR. BENJAMIN LEE, *State Board of Health, Johnstown.*

A free contribution of twenty-five hundred dollars worth of Quibell's disinfectant from Newark, England, for Johnstown, will be admitted free of duty if you want it. You must also name some United States Officer to whom it can be consigned. Answer

WYMAN, *Surgeon,*
Per Surgeon General.

(b.) *Letter of Messrs. Quibell Bros.*

NEWARK, *July*, 31, 1889.

Benjamin Lee, Esq., Secretary State Board of Health, Johnstown, Pennsylvania, U. S. A.

DEAR SIR:—We duly received your letter of the 6th. instant and we shall be very pleased if our disinfectant prove of real value to you in the great calamity that has befallen Johnstown. By this post we send you a copy of the "Newark Advertiser" for your perusal, and we shall be glad of good news. I remain,

Yours faithfully,
QUIBELL BROS.

*One U. S. gallon contains 231 cubic inches, or 8·332698 pounds.

(c.) *Acknowledgment by the Secretary.*

JOHNSTOWN, PA., *July* 6, 1889.

Messrs. Quibell Brothers, Newark, England.

GENTLEMEN:—In the name of the burgess and citizens of this stricken town, and of the State Board of Health of the Commonwealth of Pennsylvania, allow me to thank you most sincerely for your very acceptable gift. No one firm in this country has made so liberal a contribution in either money or material. As an expression of sympathy from brethren in a distant land its value is greatly enhanced. It has arrived at a fortunate time. After a month's incessant labor, often by night as well as day, resting only on the Lord's day, we have but just succeeded in clearing the streets of that portion of the town which was not swept away, of the tangled mass of débris consisting of houses, passenger coaches, freight cars, locomotives, furniture, trees, bridges, corpses and carcassess—which encumbered them up to the very roofs of the houses, and once more converting them into thoroughfares. We shall be able therefore to use a street sprinkler to great advantage and your disinfectant will come into play very acceptably in that way. Fortunately we have been able up to the present time to maintain a very fair condition of public health, but the fervid heats are yet to come and it will require unremitting care to prevent some serious outbreak of disease. Should we succeed you will have the satisfaction of knowing that you have contributed materially to this happy result. Allow me to add my personal thanks for your generosity and for your kindly expressed sympathy.

Yours very respectfully,

BENJAMIN LEE,

Secretary of State Board of Health of Pennsylvania.

15.—LIST OF DISINFECTANTS CONTRIBUTED AND DONORS.

Universal disinfecting powder, 2 barrels from C. W. Spaulding.
37 bottles Chloro Naphtholin.
110 one quart cans, 22 one gallon cans, from Robert West.
Purity, 3 barrels, and 1 gross in bottles, Egyptian Chemical Co.
Bromo-Chloralum, 2 dozen, Bromo Chemical Co.
Platts chlorides, 12 dozen quart bottles, Henry B. Platt.
Crude sanitas, 100 gallons, Sanitas Co.
Little's Soluble Phenyl, 3 barrels, Morris, Little & Son.
Ground Lime, 85 barrels, Toledo White Lime Co.
Katharmon, 1 dozen, Katharmon Chemical Co.
Powder to relieve blistered feet, C. W. Heinecken.
Disinfectants, 1 box, Titusville Roofing and Varnish Works.
Phenique, 1 barrel, W. O. Worrell.

Disinfectant, 5 barrels, Samuel Cabot.

Disinfectant, 24 barrels and 1 case, Quibell Bros., value $2500.

Rosin, 180 barrels; pine tar 200 barrels; pitch, 73 barrels, from Citizens of Wilmington N. C.

Bullen's Disinfectant, 50 gallons, Dr. H. C. Bullen.

16.—THE USE OF ROSIN IN THE DESTRUCTION OF CARCASSES

BENJAMIN LEE, M. D., *Secretary of the State Board of Health.*

It was evident to every one who saw the situation at Johnstown immediately after the flood, and noted the immense numbers of dead animals with which the ground and the wreckage were encumbered, that there was but one means of disposing of these dangerous objects, and that, by fire. This, however, was not always an easy task. There was wood enough at hand, but much of it was water soaked, and the incessant rains of the first month often made it difficult to keep fires going. It often happened that a fire would become extinguished, leaving a carcass but partially consumed. In other instances where destruction had apparently been complete, the development of a putrescent odor several days later would lead to the discovery of fragments of flesh simply charred on the surface. The difficulty was met by the generous and entirely unexpected donation on the part of citizens of Wilmington, N. C., of a large number of barrels of rosin and tar. The rosin was found to possess these very advantageous properties when applied to the cremation of carcasses. First, it substituted for the unpleasant and often sickening odor of burning flesh quite an agreeable balsamic fragrance. Secondly, it burned with a fierce heat, hastening the process of combustion, and thirdly, it could not be extinguished by the heaviest rains. The manner of using it was as follows: The carcasses were strewn thickly with the rosin and the ground immediately around them as well. Drift wood was then piled up over them several feet in depth and the wood set fire to. If necessary, more wood was added until the destruction of the animals was completed. After such a cremation it was extremely rare to be compelled to build a second fire. The tar was not nearly so powerful an aid to combustion for this purpose, but it proved very useful in burning bedding, carpets, clothing, rags and straw, articles which it could penetrate and saturate, and was largely utilized in that manner. There were also immense numbers of stumps of trees, excessively hard and covered more or less completely with earth. These too the tar aided materially in burning. The object of this note, however, is to call attention particularly to the value of rosin for the purpose above indicated. Mingling with the fat of the animal it seemed to produce an extremely inflammable compound.

It might often be well for farmers and other large owners of stock instead of burying dead animals in shallow pits, when they often become

offensive and possibly a source of disease, to dispose of them in this way.

17.—LETTER FROM COL. LEWIS W. READ, M. D. SURGEON GENERAL, NATIONAL GUARD OF PENNSYLVANIA.

NATIONAL GUARD OF PENNSYLVANIA,
SURGEON GENERAL'S OFFICE,
NORRISTOWN, *June 26th*, 1889.

MY DEAR DOCTOR:—I am very sorry not to have had sufficient leisure Sunday to have carefully examined your reports. Forms and instructions prove your having thoroughly districted your great work. I can readily understand why I did not discover any objectionable sanitary conditions during my careful personal investigation on Sunday, and tender to you my congratulations for having accomplished a great work and produced results that could only be executed by a practical and scientific sanitarian.

Very truly yours,
LEWIS W. READ,

18.—COMMUNICATION FROM THE OFFICE OF THE CHIEF ENGINEER OF OPERATIONS AT JOHNSTOWN.

Dr. Benj. Lee, Secretary State Board of Health.

DEAR SIR:—Replying to your favor of this morning in regard to refusal of contractors to remove material cast out of cellars, will say that I have investigated the matter, and contractors deny having made such refusal. I have directed that all earth or other matter thrown from cellars be removed by the contractors as soon as possible, and I shall see that this order is obeyed. Referring to your letter in regard to material in the rear of houses on Railroad street, I will give this matter immediate attention and have the débris removed.

Yours very truly,
H. F. LOFELAND,
Acting Chief Engineer in the absence of Col. Douglas.

19.—DECISION WITH REGARD TO PORTABLE HOUSES.

JOHNSTOWN, *June* 20, 1889.

Adjutant General Hastings.

DEAR GENERAL:—I have this day examined two styles of portable houses which are being put up in this place. The smaller one is much too small, flimsy in material and construction, and evidently only intended as a hunter's summer shelter. I should condemn it as a habitation for a family. The other is more substantial: has a solid floor and shingle roof, and would stand the weather. Its dimensions are 16X24 feet. A small family could find accomodation in one of these, but

families of any considerable size would require two of them communicating, in order to avoid dangerous over-crowding.

I have the honor to be,
Dear General,
Yours respectfully,
(signed) BENJAMIN LEE,
Secretary.

20.—REPORT OF THE COMMITTEE ON HOME SANITATION.

(a.) *Reports.*

JOHNSTOWN, *June* 13, 1889.

To the State Board of Health,

GENTLEMEN:—One thousand circulars calling resident women together having been distributed by the State Board of Health, the meeting was called for 10.30 A. M., June 13. Twenty-five women responded to the summons. The meeting was presided over by Miss Harriet Duncan of Johnstown.

A committee called "Committee of Reference" was appointed. This committee is made up of 20 women residing in the seven different health districts of Johnstown and vicinity. They will give counsel and aid to a committee of "District visitors" from a distance who devote all their time to house-to-house visitation in the districts to which they are assigned.

One district visitor was secured and three others telegraphed for.

Places of residence for two district visitors were secured.

Headquarters were established on Main street, next to post-office.

Two thousand forms were ordered printed for use of district visitors for daily report of work.

In addition, Dr. Alice Ewing has made six professional visits, found one case of measles at 354 Main street, and reported it to headquarters of State Board of Health.

(Signed) KATE C. BUSHNELL, M. D.
ALICE EWING, M. D.

JOHNSTOWN, *June* 14, 1889.

To the State Board of Health.

GENTLEMEN:—Provision has been made for district visitors in five of the seven health districts.

Visiting has already begun. Fourteen homes have been visited in Homersville. Many houses and cellars are being cleaned. Some are being neglected. A few have white-washed; others are asking for lime for white-washing. Some are not able to clean on account of age and other disabilities. We will be able to make exact reports after Monday.

Complaints coming from the better classes that the lower classes are dragging pillows, mattresses, carpets and clothing out of the mud and

water to stow away in their houses, thus further endangering public health.

Dr. Ewing made five professional visits. Found one more case of measles at 354 Main street, and reported it to State Board of Health.

(signed) Drs. BUSHNELL and EWING.

(*b.*) *Form of Complaint.*

Date, ...

1. Help needed to clean cellar.	ADDRESSES.
. . . . .	. . . . .
2. Help needed to whitewash, etc.	. . . . .
. . . . .	. . . . .
3. Help needed to clean house.	. . . . .
. . . . .	. . . . .
4. Help needed in leaving town.	. . . . .
. . . . .	. . . . .
5. Disinfectants needed.	. . . . .
. . . . .	. . . . .
6. Clothing and bedding needed (appended list),	. . . . .
. . . . .	. . . . .
7. Furniture needed (appended list).	. . . . .
. . . . .	. . . . .
8. Overcrowded houses.	. . . . .
. . . . .	. . . . .
9. Negligent in cleaning cellars.	. . . . .
. . . . .	. . . . .
10. Negligent in cleaning house.	. . . . .
. . . . .	. . . . .
11. Sick (report to District Medical Officer).	. . . . .
. . . . .	. . . . .
12. Members, ... Church.	. . . . .
Members, ... Church.	. . . . .
Members, ... Church.	. . . . .
Members, ... Church.	. . . . .
Members, ... Church.	. . . . .
. . . . .	. . . . .
13. Urgent need of home.	. . . . .
. . . . .	. . . . .

21.--REPORT OF DR. SPENCER M. FREE, MEDICAL DIRECTOR IN CHARGE AT CAMBRIA CITY.

June 15, 1889.

Dr. Benjamin Lee, Secretary State Board of Health.

DEAR SIR:--This report is respectfully submitted of work done by the Cambria City Division of the State Board of Health.

At Peelorville, Minersville, Cambria City, Morrellville and Coopersdale, the circulars of the State Board of Health sent to this headquarters have been posted, and circulated by distribution to houses. These include, the "Bulletins," the circular of important information, the one concerning the removal of families from the city, and those concerning contagious diseases.

Reports from Dr. Miller say that a child has died at Minersville with measles, that the case of typhoid fever before reported is said to be *very* ill, though Dr. Miller is not the attending physician. There is no other case. No case of diphtheria or scarlet fever exists. There are several cases of measles, but the doctor could not say how many.

Disinfectants are freely furnished, but not very freely used. The people have been urged again and again to use them but seem rather indifferent. The depot for their distribution is at the hose company's house. The health and general condition of Prospect is good.

Dr. Porch, of the Cambria City district, reports the continuance of good health. There is no case of typhoid fever, diphtheria, scarlet fever or of any contagious disease except measles, at either Cambria City or Brownstown. At my suggestion the doctor handed me a list of patients visited June 14th, naming the ailment of each. This will give you a good idea of the prevailing diseases. It is as follows:—

Disease.	*Cases.*	*Disease.*	*Cases.*
Bad cold,	9	Constipation,	3
Colic,	3	Sprained ankle,	2
Wounded finger,	1	Wounded leg,	1
Neuralgia,	1	Eczema,	1
Otitis,	1	Bruises,	1

A complaint coming to me that merchants here and at Morellville were selling spoiled goods or at least in such condition that they were injurious to health, I requested a report from Dr. Tomb and from Dr. Porch.

Dr Tomb says that such is not the case at Morellville. Dr. Porch reports for Cambria City as follows:—

That four merchants are selling goods. That none of them are injurious to health. The labels are off of many cans of goods, and some of the cans are rusty. The flour and meat sold are new lots and not saved from the flood. Dry goods and notions are wet and muddy. Not much is being sold.

Before receiving your blanks which were sent to-day to my inspectors from your office, I had asked Drs. Porch and Tomb to send me the following report, number of house, street, size, number of people in it, clothing of people, bed clothing, food supply, condition of cellar, (whether cleaned or not). I have his (Dr. Porch's) report of a part of the city, but since receiving your blank I have asked him to quit and to start anew with your blank. I might say that he reports sufficient clothing, bed clothing and food. The houses are all well filled, but in only a few instances is there over-crowding. The cellars are nearly all cleaned; The examination includes only two streets, Second avenue and Railroad street, having forty-two houses yet standing and inhabitable.

Dr. Tomb reports no case of over-crowding at Morellville, and that the people have plenty of clothing and bedding, as also food. That the cellars are all cleaned and disinfected and nearly all yards cleaned up.

A good deal of work has been done about Cambria City in the way of discovering and removing dead animals—horses, sheep, hogs, cats and dogs, hides, slaughtered beef in large quantities, etc. All these have been destroyed by fire.

Cellars have been cleaned for a few old, or feeble people or poor widows who have no boys to do it for them.

Lumber has been furnished to a number of people for water closets. A few have been built of a temporary character for worthy people unable to pay for building them.

Some places containing stagnant water and filth of various kinds have been filled up with dirt and ashes, after cleaning out thoroughly and burning the combustible matter.

Two bodies have been found since my last report. The first one found, number 766, was that of a little girl. The description accompanies this report. The second body found, number 767, was that of William B. Hess. Identified by his son, also by his name in India ink on his forearm. Both bodies were buried in the Lower Yoder cemetery.

I have sent a good supply of disinfectants to Brownsville and Morellville and left an order at Coopersdale for them to bring here for a plentiful supply. They failed to come for them and I shall send them down on Monday.

I laid off all my men until Monday as I think the situation does not at present demand Sunday work.

Dr. Tomb showed me an order of June 14th, instructing him to procure men and clean out a swamp just below Morellville which is a menace to the public wellbeing. I visited the place twice to-day. The gang was doing good work. They burn all the débris and will open a channel to drain the place.

He, this evening received word to discontinue. He referred to me and I told him to obey your order unless countermanded. The disinfectants he ordered had not yet arrived at 6 P. M. to-day.

I have plenty at present. If they need any, I can send them down. Dr. Tomb has the time of his men and will send it to you or to me. I enclose the list of my men, being a transcript of my time book.

If I may be allowed a suggestion—would it not be well to issue a circular or an order urging or compelling each family to put all refuse, such as papers, hay, rags, etc., and garbage into a barrel, and have the barrel removed as often as necessary.

At present most of the people throw these things on the street or in the alley.

Yours truly,

SPENCER M. FREE, *State Inspector.*

22.—A SUNDAY IN JOHNSTOWN.

(a.) *Head-Quarters Sanitary Corps, 370 Bedford street.*

JOHNSTOWN, PA., *June* 16, 1889.

Dr. E. W. Matthews, Chief Deputy Medical Inspector.

DEAR DOCTOR:—This being Sunday, the matter of work was left entirely with the men; and it was intended to give them a general day of rest. In view of being away from home and having no place to go to, a number volunteered to work. One gang was sent out Sandy Vale cemetery and vicinity, under Mr. West.

One gang, under Mr. Brandridge, went to Camp McNight and removed a dead horse, and entirely consumed the carcass, which was partly consumed before.

From there to the Merchants' hotel, where he represents he would have burned a dead horse but the force was too small. So he reports he completely destroyed a horse rear of Swank's Hollow.

At headquarters, 2 carloads were unloaded of lime, car N. Y. H. and H. R. R. No. 12953. Contents 137 bbls. lime.

1 car load rosin B. and O., car No. 36402 contents 80 bbls. rosin.

An Inventory

was made by Mr. Sill, in charge of the distribution of disinfectants, who reports the following material on hand:

184 sprinkling cans.
7 bottles prophylactic fluid.
166 bottles carbolic acid.
5 boxes corrosive sublimate.
23 barrels copperas.
12 barrels zinc chloride.
2 barrels purity liquid.
80 cases bromine, in 2 quart bottles, 15 to a case.
29 boxes carbolate lime, 25 lbs. each.

1 carboy ammonia.
1 carboy disinfectant fluid.
2 carboys muriatic acid.
80 barrels rosin.
27 barrels Bullen's liquid disinfectant.
137 barrels pure white lime.
8 tanks (iron) crude carbolic acid, 100 gallons each.
7 tanks (iron) carbolic acid.
40 barrels crude oil.
8 barrels marked disinfectant.
2 barrels purity liquid, in pint bottles.

Eleven men were on duty yesterday about head-quarters, unloading material from cars.

Fourteen men on duty at laborers' eating house, at Camp Mack.

Dr. Wagoners report of time is not in yet.

Small quantities of disinfectants were given to private families of which we can give you the names if needed.

One wagon load of lime was brought from Pennsylvania Railroad and distributed to the public points for distribution.

One one horse wagon load of lime was sent to Hornerstown to be distributed from the head quarters of distribution at Kramer's store.

Mr. Van Rippel, Horner street was furnished with, 1 half barrel chloride lime on special requisition of Secretary Lee. Enclosed please find Dr. Sheridan's report for the day.

Respectfully,

ELDER.
370 *Bedford street.*

HEAD QUARTERS SANITARY CORPS,
370 BEDFORD STREET, JOHNSTOWN, *June* 16, 1889.

Distribution of Disinfectants.

Dr. E. W. Matthews, Chief Deputy Medical Inspector

DEAR SIR:—The following is a report of the work performed at this station for June 16, 1889.

Number of men employed	117
One-horse wagons	2
Two-horse wagons	3
One-horse carts	2

Distribution.

One wagon loaded with bromine in (5) cases, in charge of Mr. Heller and men, for lower end of the town; these people instructed the citizens how to use this disinfectant. 75 bottles distributed.

One Cox disinfectant (bromine 1 bottle) to W. H. Walters distributing agent at Sheridan station.

Sent to Dr. Pringle, East Conemaugh:
3 barrels copperas.
1 barrel chloride lime.
1 barrel Bullen's disinfectant.
Dr. Wagoner, Kernville:
½ dozen bottles carbolic acid.
1 bottle bromine.
1 keg chloride lime.
3 boxes carbolate lime.
1 dozen bottles Purity.
2 barrels Bullen's Disinfectant.
Sent to Adams street morgue, 186 coffins, consigned to J. W. Patton, Superintendent Baltimore and Ohio Railroad, from E. S. Early & Son; these coffins were falling apart from exposure.
Red Cross Headquarters:
2 boxes carbolate lime (50 lbs).
1 barrel copperas.
1 barrel Bullen's Liquid Disinfectant.
1 box (15 bottles) bromine.
6 barrels lime.
W. S. Kramer, corner Franklin and Vine:
½ dozen bottles carbolic acid.
1 bottle bromine.
1 package (25 lbs.) chloride lime.
3 boxes (75 lbs.) carbolate lime.
12 bottles Purity.
2 barrels Bullen's Disinfectant.
34 sprinkling cans.
5 boxes bromine (15 bottles each) were sent to the drift. Some of these were left in public places for general use.
1 bottle bromine for distribution at head-quarters.
Received:
1 carriage from Atlantic City, for use of medical staff.
Baltimore and Ohio car 35117, A. B., from J. B. Scott, Pittsburgh. 188 sprinkling cans.
1 case (24 bottles) Darby's Prophylactic fluid, from J. H. Zelin & Company, Philadelphia.
48 boxes (25 lbs. each) carbolate of lime, from James Good, Philadelphia.
1 barrel disinfectant powder, from C. Knecht, Philadelphia, Pa.
Baltimore and Ohio car, 35308,
3 bbls Purity in bulk, Egyptian Chemical Company, Boston, Mass.
1 Carboy disinfecting fluid, The A. Colborn Company, Philadelphia.
We advised all persons as per instruction, to put their houses in order.

Morrellville and vicinity (No. 31, foreman and 4 men.)
Burned one cow.
Burned one dog.
All the clothing taken from Mrs. Lenden's house.
No. 5, foreman and 6 men.
Cleaning Dr. Lowman's house.
Burned two horses.
Wm. West, 7 men.
Burned cow, and general sanitary work on Main street; also burned some horses on line of Baltimore and Ohio Railroad.

(b.) *Report of Bedford Street Hospital, Dr. J. C. Sheridan.*

JOHNSTOWN, PA., *June* 16, 1889.

The report furnished by physician in charge of Bedford street hospital for to-day is as follows. Out door cases treated after 6 P. M. Saturday, 15.
Thomas P. B., Woodvale, sore throat.
Frank D., Johnstown, nervous prostration.
George F. C., Johnstown, sciatica.
Mr. H., Johnstown, lumbago.
William C., Johnstown, prostration.
For June 16. The indoor patients are doing well. The outdoor patients treated up to 6 P. M. to-day are:
Charles B., Johnstown, cut eye.
S. C. J., Scott Haven, Pa., prostration.
Thomas M., Morris, Pa., injured foot.
Mr. G., Johnstown, Pa., injured head.
Mr. H., Johnstown, Pa., lacerated hand.
L. W., Johnstown, Pa., lacerated fingers.
W. T. S., Johnstown, Pa., cut hand.
William V., Johnstown, Pa., general prostration.
Barney B., Philadelphia, Pa., remittent fever.
J. E. W., Alumbank, Pa., pharyngitis.
Unknown female, Johnstown, injured finger.
Miss E. G., Johnstown, injured finger.
D. C., Cumberland, injured finger.
William B., Pittsburg, injured finger.
P. H., Bradford, Pa., injured finger.
C. Z., Johnstown, injured foot.
Number of patients remaining in Hospital at last report, 7.
Number Admitted.
Number Discharged.
Number Dead.
Number remaining at close of this report, 7.

Number of prescriptions filled since last report, 138.
Number out-door patients treated, 21.

Respectfully submitted by,
Dr. J. C. SHERIDAN,
Resident Physician.

Respectfully referred to State Board of Health, Dr. Benjamin Lee, Secretary.

J. E. SILLIMAN.
In charge Medical Department.

(c.) *Red Cross Society, "Camp Barton."*

JOHNSTOWN, PA., 6-16-89.

Dr. Benjamin Lee, Secretary State Board of Health.

DEAR SIR:—We beg leave to submit this report of the cases treated by us to-day.

Noah C.—26—Moxham, conjunctivitis.
Thomas G.—48—New York, constipation.
Augustus E.—24—Trenton, constipation.
Mrs. Sarah M.—74—129 Morris street, debility.
Emma G.—3—Grubtown, torpidity of liver.
Harry H.—28—Grubtown, pleurodynia.
John F. —3—Grubtown, paralysis of deltoid.
Joseph K.—64— Grubtown, ulcers of foot.
Jacob E.—23—741 Pine street, coryza.
Mrs M.—27—744 Pine street, diarrhoea.
Baby M.—6 weeks—diarrhoea.
Jacob S.—35—Kernville, necrosis of tibia.
William E.—41—Beaver Falls, constipation.
Otto N.—8 months—181 Sherman street, nervous prostration.
R. J. S.—53—malaria.
Herbert M.—2—Horner street, scrofula.
George B.—22—Ohio, malaria.
Old cases treated number seven.

Contagious Hospital.

One case diphtheria- age nine thoroughly convalescent from a mild attack—discharged on the 15th.

The other case—diphtheria with marked heart symptoms as reported—had premonitions of sudden heart failure. This condition persisted in spite of all efforts to sustain strength and maintain circulation and temperature. This case terminated fatally 2 P. M. Sunday. Sudden heart paraylsis.

Remaining in Hospital, one case traumatic erysipelas

(d.) *Report of the Cambria Hospital, Johnstown, for Sunday June 16, 1889.*

To Dr. Benjamin Lee, Secretary State Board of Health.

DEAR SIR:—There have been no admissions to the hospital since the last report. The following is a statement of cases treated in the dispensary.

	MALES.	FEMALES.
Abscess of hand,	1	
Bronchitis,	1	3
Constipation,	3	1
Contusion of abdomen,		1
Contusion of toe,	1	
Debility,	2	1
Diarrhœa,	1	
Eczema;		1
Felon,	1	
Green stick fracture (of radius),	1	
Hemorrhoids,		1
Malaria,	1	1
Measles,	1	1
Pharyngitis,	1	
Phthisis,	1	
Continued fever,		1
Tooth extracted,	1	
Total,	16	11

Respectfully submitted,

A. HEWSON, JR.,
Surgeon in charge pro tem.

(e.) *Reports of Inspectors.*

JOHNSTOWN, PA., *June* 16, 1889.

Dr. W. E. Matthews,

DEAR SIR:—I have been through my district and find the sanitary condition pretty good. Our people are using the disinfectants. No cases of contagious disease, except measles, and it is of mild form. I have to report, however, two cases of dysentery, and they are both rather bad cases; one at Morrellville on Blain street, and the other in the neighborhood of Sheridan station.

Respectfully submitted,

B. F. TOMB, M. D.

P. S.—I also send you the *time* of my men employed on Saturday, cleaning and draining a swamp between Morrellville and river bank. I have a few men at work to-day, but after to-day will discharge them.

B. F. TOMB.

JOHNSTOWN, PA., *June* 16, 1889.

Dr. Matthews,

DEAR DOCTOR:—I have to report that I have to-day made a thorough inspection of my district. I found no sickness of any account, and no contagious disease at all. I have had some decaying animal matter removed from Main street, and attended to some other minor matters. Everything is in good condition.

Yours, etc.,

J. C. SHERIDAN,
Deputy Medical Inspector.

JOHNSTOWN, *Sunday, June* 16, 1889.

W. E. Matthews, M. D.

Below please find my report.

Visited camp of Red Cross, and camps of two engineer corps in upper end of Hornerstown: found everything satisfactory.

Visited Camp Mack on Baltimore and Ohio Railroad. All right except scarcity of bedding. Gave order for six blankets and four mattresses.

Visited all camps between Main street and Conemaugh river; dampness and pools of water incident to late rains, the only difficulty. Having pools drained where it is possible. The water however, not, as yet, doing any harm.

Visited camp of Pennsylvania railroad above depot; additional water closets and privileges are being erected to-day. No sickness discovered anywhere.

Respectfully submitted,

C. SHERIDAN, M. D.
General Inspector of Camps Board of Health.

JOHNSTOWN, PA., *June* 16, 1889.

Dr. S. M. Free, in charge Cambria City.

DEAR SIR:—Everything quiet to-day except the drunken men, of whom there are quite a number. On Broad street, 417, there is a pool of water stagnant, and becoming offensive. At the lower end of Broad street are the remains of some partially buried carcasses in a state of decomposition, and should be completely burned immediately. Cellar of church near Cambria Iron Company's brick yard, lower end of Broad street, should be thoroughly disinfected. The excavations on Railroad street and Second avenue, and Broad street and Third avenue, are still in the same condition as per last report; a good many cellars in a filthy condition and should be cleaned and disinfected.

Respectfully,

G. B. PORCH.

JOHNSTOWN, PA., *June* 17, 1889.

Dr. W. E. Matthews,

DEAR SIR:—Yesterday, June 16, in pursuance of my orders issued by Dr. Groff, I went to Nineveh and returned to inspect Sang-Hollow, and return to-day. The report of which work I will turn in in a short time. To-day I was over my own district. No cases of contagion to report. Have four cases of sickness; one case of migraine; one case of laryngo-pharyngitis, and the other cases, colds. We are pretty well supplied with provisions and clothes. Have received a lot of shoes, but not enough. We will have them in a few days I think.

Respectfully submitted,

H. F. TOMB, M. D.

(f.) *Report of Military Camps.*

JOHNSTOWN, PA., *June* 16, 1889.

Benj. Lee, M. D., Secretary State Board of Health.

DEAR SIR:—The health report of the occupants of the military camps is excellent, only a few cases of a mild attack of diarrhœa, and a few cases of pharyngitis.

The food is excellent and well prepared.

Very respectfully,

J. E. SILLIMAN,

In charge of Military Department.

(g.) *Report of Laborers Camps.*

JOHNSTOWN, PA., *June* 16, 1889.

To Dr. J. E. Silliman, Major and Surgeon, 2d Brigade N. G. P., Chief of Medical Department.

SIR:—I have the honor to submit the following report, as the result of a careful inspection of the sanitary condition of the camps and quarters of laborers, at present employed in removing the débris in and about Johnstown.

The quarters of the men, as a rule, are not up to the standard, failing in almost every particular recognized as requisite in a camp where it is possible to establish thorough military surveillance, policing, etc. This is due in great part, to the difficulty in bringing the men employed to a realization of the importance of perfect cleanliness in regard to both person and their surroundings in quarters.

The kitchen departments for the different laboring gangs are not perfect, but are better in a sanitary way, as all animal and vegetable refuse is regularly destroyed by fire. Taken in comparison with the former encampments of the men employed by Captain W. R. Jones, and Booth and Flinn, and others, the present suffer by contrast. I would very respectfully recommend the increase in the amount of disinfectants

used, and would also recommend the employment of a regular force of men with carts, to do nothing else but attend to the renovation of quarters, and the burning of the ordinary débris and accumulations of the laboring camps. The water supply is good and plenty of it. The atmospheric condition is good, the quantity and quality of the food furnished of the very best, and, taken all in all, I am of the opinion that with proper regulations established, we will not only prevent any serious sickness among the men, but have cause to congratulate the medical department, as well as the community at large, at the close of our labors.

Very respectfully submitted,

ALEX. Æ. MCCANDLESS,

Major and Surgeon in charge laboring camp at Johnstown.

Respectfully submitted to Benj. Lee, M. D., Secretary State Board of Health.

J. E. SILLIMAN,

In charge Medical Department.

(h.) *Report of the Morgues.*

JOHNSTOWN, PA., *June* 16, 1889.

Benj. Lee, M. D., Secretary State Board of Health.

DEAR SIR:—After the report of June 15 was closed, the body of a male baby was found in the debris at the office of the Cambria Iron Company. It had the appearance of being six months of age; it was clothed in a plaid dress, red and black skirt, shoes. Unknown.

To-day a man 45 years of age, weighing about 180 pounds, brown moustache and whiskers; three bladed pocket knife; horn snuff box; one key. Unknown. Buried at Prospect Hill. Unknown woman, about 30 years of age, weighing about 150 pounds; blue gingham apron; red calico dress, with patty-pan shaped figures; several hair-pins in pocket; one scarf pin, rhine stone set; plaiting on waist. Had not been a mother. Burried at Prospect Hill. The above bodies were cared for at the Presbyterian church morgue.

At the 4th ward school house morgue, no bodies were received.

At the Millville morgue the following mentioned bodies were taken care of, viz:

Unknown female, aged about 22 years, weight about 140 pounds; height 5 feet 7 inches; light complexion, dark hair; black alpaca dress; white under skirt; red waist; brown ribbed stockings; no shoes.

Unknown female, age about 35 years; weight 135 pounds; height 4 feet 10 inches; dark garnet dress; white stockings; No. 5 shoes; no valuables.

Unknown female, age about 40 years; weight about 140 pounds; height 5 feet; hair, dark and very long; black ribbed jersey; black dress; white and black striped skirt; ladies hunting case watch.

Unknown female child, about 10 years of age; height about 3 feet 8 inches; light hair; shoes, and one gum shoe; ribbed stockings; red flannel underwear; brown dress; one pair ear-rings.

Unknown male, age about 45 years; weight 150 pounds; height 5 feet 9 inches; dark shirt; dark pants; brown coat; pocket book; gold ring; pocket knife.

Unknown female child, aged about four years; weight about 40 pounds; height 3 feet; barred dress; white collar; child's gold pin.

After the report of the 15th was sent in, I received the following report from the Cambria morgue:

Unknown female, about 30 years of age, white; light complexion; brown hair; weight about 130 pounds; 5 feet 5 inches; red chintz dress; dark skirt; black and white striped stockings; button shoes; white muslin underwear; plain gold ring on middle finger of left hand; pocket book with $3.33; package of needles, thimble and one shoe buttoner. Buried in Lower Yoder cemetery. Found on Chestnut street near merchant tailor shop.

One case was reported Saturday 15, from Minersville, and buried in the Catholic cemetery at Morrellville; no description furnished. Two were also reported from Morrellville Saturday evening, without description.

From Morrellville, a child of 4 years was reported as having died, but no cause of death was stated; coffin furnished by Morrellville morgue.

Respectfully submitted,

J. E. SILLIMAN,
In charge Medical Department.

(i.) *Report of Major Silliman on the Dead.*

JOHNSTOWN, PA., *June* 15, 1889.

Major J. E. Silliman, Chief of the Medical Department.

DEAR SIR:—I have the honor to make the following report:

I visited Nineveh on June 11th. By Coroner's report, I found there had been 221 bodies recovered to June 10th. Of this number, there were 39 men, 83 women, 38 boys, 27 girls, 34 infants.—221 (total.) Fifty-six (56) bodies have been identified and taken away by friends.

Forty-three (43) bodies were buried here that were identified but allowed to remain. Total number identified, 99. Leaving 122 unknown.

The description given of those marked unknown was so meagre as not to admit of identification from record. The bodies have been buried in a plot of ground bought and set aside by the county commissioners of Westmoreland county for that purpose, and called Westmoreland Cemetery.

Graves numbered to correspond with record. All trinkets and valuables left in the hands of Deputy Coroner Rogers, of Nineveh. No resident physician in the place; no sick; no destitute; morgue cleaned and thoroughly disinfected; badly in need of some disinfectant. County Commissioner Shaw reports the river front cleaned of the bodies of all dead animals, the full length of the county.

At Millvale or Minersville there have been 47 bodies buried.

Of the number 32 were identified.

5 unknown males.

2 unknown females.

5 unknown boys.

1 unknown girl.

And 2 bodies, neither sex or description of any kind.

These bodies were buried in Dunkard Cemetery. The morgue has been cleaned and disinfected; no physicians in the place.

1 case of typhoid fever reported.

20 cases of measles.

7 coffins at the morgue.

All bodies picked up at Coopersdale were taken to Minersville.

No record was taken.

The flooded portion has been cleared of all bodies of dead animals.

No resident physician.

No sickness reported.

No stores open.

Every body to be fed.

Supplies short.

No lives lost in this place.

At Morrellville they buried 225 bodies.

Of these 68 were known males.

58 were known females.

3 were unknown males.

13 were unknown females.

1 unknown boy.

2 were unknown girls.

1 known boy.

3 were known girls.

There were 70 unknown children; no description

There were 6 known children no sex noted.

Some of the identified taken away by friends.

Morgue cleaned and disinfected.

There are 40 coffins on hand at this time.

I received a report from Dr. G. B. Porch of Cambria City, dated June 3th, taken from the records in the hands of Father Davine, stating that (851) eight hundred and fifty-one bodies have been buried from that place; of this number only (41) forty one have been identified.

The cemetery is in Lower Yoder township. Two physicians in the the place.

Good supply of drugs.

Good supply of disinfectants.

Bodies of all dead animals have been removed and burned.

He also states there are no undertakers needed.

Respectfully submitted

W. M. JOHNSTON,

Assist. to Chief of Medical Department.

Respectfully submitted to Benjamin Lee, M. D., Secretary State Board of Health.

J. E. SILLIMAN, *Chief of Medical Department.*

22.—CONDENSED DAILY REPORT OF DISEASES AND SANITARY CONDITION OF JOHNSTOWN HOSPITALS, CAMPS AND DISTRICTS, JULY 12, 1889. NINE PHYSICIANS REPORTING.

DISEASE OR INJURY.	NUMBER OF CASES.					
	HOSPITAL.			OUT-DOOR AND DISPENSARY.		
	New.	Discharged.	Remaining.	New.	Discharged.	Remaining.
Typhoid fever,						2
Malarial fever,	2	1	3	2		6
Scarlet fever,						
Diphtheria,					1	
Measles,				2		13
Erysipelas,			1			
Constipation,				5	1	5
Diarrhœa,	1		1	37	15	37
Dysentery,			3	4	4	7
Dyspepsia,				10		10
Pneumonia,				1	1	
Bronchitis,			2	5	1	7
Tonsilitis,				2	1	1
Croup,				1		1
Nervous prostration,				6	3	7
Rheumatism,				1	2	4
Injury,			6	5		8
Cholera infantum,				5	3	6
Cholera morbus,				3	1	3
Other complaints,					2	2
Total,	3	1	16	89	35	119

23.—ARTICLES OF AGREEMENT WITH C. McLEAN & CO.

Articles of agreement made and concluded this — day of July 1889, between C. McLean & Co., of Philadelphia, Pa., parties of the first part, and General D. H. Hastings, Adjutant General, for, and in behalf of the State of Pennsylvania, party of the second part:

Witnesseth. The parties of the first part hereby agree and bind themselves to do all the work which the Board of Health of the State of Pennsylvania may require at and in Johnstown and the adjacent boroughs, in a prompt and thorough manner, and to employ such number of men and teams as the supervising engineer may prescribe from time to time, and to employ said force at such places and in such manner as said engineer may direct.

The State of Pennsylvania agrees to pay to said McLean & Co., for doing and performing said work.

For laborers,	$1.50 per day.
Skilled laborers,	2.00 per day.
Carts, horse and driver,	3.00 per day.
Wagons, pair of horses and driver,	5.00 per day.
Foremen,	3.00 per day.
General foremen, not to exceed two,	3.33⅓ per day.
Cooks, not to exceed two,	1.50 per day.
Stablemen, not to exceed three,	1.50 per day.
Assistants at camp with cooks, not to exceed five	1.50 per day.
For water boys, not to exceed one to 25 men,	75 per day
For bridge carpenters,	3.00 per day.

One foreman will be allowed each 25 men, and upon the total cost, based upon the prices herein enumerated, the said McLean & Co., shall be paid ten per cent.

It is understood and agreed, that this agreement shall go into effect on Monday, July 8th, and continue until such time as the Board of Health may terminate it.

As witness the signatures of the parties hereto this—day of July, 1889,

Witnesses:

24.—RESOLUTIONS OF THANKS TO VOLUNTEER PHYSICIANS, AND TO OFFICERS OF THE DEPARTMENT OF PUBLIC SAFETY OF PITTSBURG, AND THE BOARD OF HEALTH OF ALLEGHENY.

(a.) *To Physicians.*

Resolutions passed at the Thirteenth Regular Meeting of the State Board of Health, of the Commonwealth of Pennsylvania, held at Johnstown, July 10th 1889.

Resolved, That the thanks of the State Board of Health are eminently due, and are hereby tendered to Dr. ——, for his arduous, indefati-

gable and efficient services, so generously rendered, as a volunteer member of the sanitary corps of the Board at Johnstown, in aiding in the important work of preventing epidemic disease as a result of the recent disastrous flood in the Conemaugh valley.

attest: BENJ. LEE, M. D.,
Secretary and Executive Officer.

(b.) *To the Officers of the Department of Public Safety of Pittsburg and the Board of Health of Allegheny.*

STATE BOARD OF HEALTH.

JOHNSTOWN, — — —, 1889.

Resolved, That the thanks of the Board of Health are due to the Department of Public Safety of the city of Pittsburg, for the prompt and generous assistance rendered the State Board of Health and the citizens of Johnstown, in their hour of calamity, in sending its admirable police force to aid in the work of preserving the health of the Conemaugh valley, and the city of Johnstown.

Resolved, That to Mr. Baker, the officer in charge, and to each member of his force, thanks are due for the efficient manner in which the duties of this force were performed.

Resolved, That this resolution be printed and sent to Mr. Baker, and each member of the force.

(c.) *List of Officers and Employes of the Department of Public Safety, city of Pittsburgh, who rendered service at Johnstown:*

General Office.

J. O. Brown, chief of department, Sidney H. Trotten, bookkeeper.

Bureau of Police.

Gamble Weir, superintendent, Roger O'Mara, assistant superintendent, John McAleese, inspector, John McRoberts, lieutenant.

Detectives: John P. McTighe, Robert G. Robinson, Patrick Carrigan, Jeremiah Gumbert, H. C. Fehl, James Mulvehill.

Patrolmen: Oliver Peoples, William Rodgers, Andrew B. Scott, Garret Crossan, Charles Mersheiner, Charles Cramer, Frank Yeager, John Moen, John Moore, Robert Fowler, John Moran, John Brennan, Benjamin Rosenblatt, Isaac Hames, Frederick Ludwig, James O'Hara, Henry N. Deahl.

Bureau of Fire.

Samuel N. Evans, superintendent, John Steel, 1st assistant superintendent, William Coates, 2d assistant superintendent.

Captains: Michael Hannigan, Evan Davis, George W. King, Philip McGuire, G. A. Datte.

Lieutenants: R. C. Rowley, George W. McIntire, J. H. Acheson, John Phillips, Henry Anderson, Robert McKinley.

Engineers: Daniel J. Eckles, James Whalen, Richard Rowe, David McRoberts, William Michaels, Alonzo Kennedy, James Miller, John Murphy.

Stokers: Matthew Sloan, Michael McSteen.

Drivers: George Heinz, William Bennett, George Kramer, James Young, James F. Lalus, John Dalzell.

Hosemen: Martin Kinley, Charles H. Hart, John Benning, John Paisley, William Kramer, John Hays, Charles Woods, Henry Heinz, William Michel, H. Gillis, Elmer Figley, Harry Mooney, George McClelland, Thomas McHenry, Elmer Croco, John Burns, L. Richards, Robert W. Thomas, John Sharron, John Whalen, S. S. Lichtenthaler, Richard Scanlon, Isaac Craig, John S. Allen, John Allison, William McNeilley, Edward Geise, Thomas Weir, Sebastian Schnupp, John Baker, Joseph E. Sees, Samuel Ramsey.

Laddermen: Frederick Silvis, James Golden, William Lenhard, Andrew Burns, David Mitchell, James Madden, Joseph Zoog, Bryce Feaster.

The Fire Bureau had in service while on duty at Johnstown, five steam fire engines; four hose carriages; and 4,500 feet of hose.

Bureau of Health.

Thomas W. Baker, superintendent.

Sanitary Policemen: Henry Barlow, J. F. Jones, David Price, Edward M. McKenna, Charles Havis, George W. Moore, B. McCoy, H. Nye, Nathan Gibbins, Thomas Dallas, Gus Stitzer, John Barr, Richard Morgan, M. S. Broheck.

Bureau of Electricity.

Morris W. Mead, superintendent.

Operators: A. M. Neeper, Henry Angloch, Henry Hemminghouse. Thomas Hannan, repairman.

Bureau of Building Inspection.

Martin G. Frank, building inspector, John Eichleay, Jr., assistant building inspector, J. A. A. Brown, clerk.

(d.) *Thanks to the Board of Health of Allegheny.*

Resolved, That the thanks of the State Board of Health are hereby tendered to Mr. R. T. Pearson, Mayor of the city of Allegheny, for his prompt action in sending a portion of the sanitary police of that city to aid this Board and the stricken citizens of the city of Johnstown and its suburbs, in their efforts to prevent the occurrence of disease as a result of the disaster which has recently befallen this beautiful valley.

Resolved, That the thanks of the Board are hereby tendered to each member of the force for his cheerfully rendered and efficient services.

Resolved, That this resolution be engrossed and transmitted to his Honor, Mayor Pearson.

(e.) *Names of Sanitary Police from the City of Allegheny.*

Benjamin Lee, M. D., Secretary.

DEAR SIR:—Your communication to Mayor Pearson asking for the names of the sanitary police sent by our city to Johnstown, has been referred to me; names are as follows:

John Leppert, Geo. Richards, J. D. Ackley, C. J. Lang, John Seymore and James S. Baird, in charge of Drs. Gilleford and Woodburn.

Very Respectfully,

JAMES BRADLEY,
Health Officer.

25.—MILITARY GUARD.

(a.) *Requisition for Military Guard.*

JOHNSTOWN, PA., *June* 24, 1889.

General J. A. Wiley, Department of Public Safety.

DEAR GENERAL:—I hereby make requisition for a guard of one to be placed at my headquarters, 55 Adams Street, and for a guard of one to be placed at the head quarters of my sanitary corps, 370 Bedford street. The latter to be especially instructed to see that fire is not brought near the petroleum, tar and rosin barrels.

Yours respectfully,

BENJAMIN LEE, *Secretary.*

(b.) *Thanks for Guard for Office and Stores.*

JOHNSTOWN, PA., *July* 26, 1889.

Captain George C. Hamilton, Chief Engineer.

DEAR SIR:—Accept my thanks for your prompt attention to my request for a guard. I apprehend trouble from these discharged men tonight, and will ask for a guard for the night as well as the day.

Yours truly,

(Signed) BENJAMIN LEE,
Secretary.

P. S. If I thought I should be sustained all around, I would declare the sale of intoxicating liquors a nuisance, dangerous to the public health, and call on you to aid in its abatement. L.

(c). *Request for Guard for polluted Spring.*

JOHNSTOWN, *July* 27, 1889.

Captain George C. Hamilton, Chief Engineer.

DEAR SIR:—I hereby make requisition for a military guard, to be placed over the spring at the east end of Mrs. Holrayd's house on Cole-

man avenue, south of Band street, Moxham; whose duty it will be to prevent any one from taking water from said spring.

Yours truly,

BENJ. LEE,
Secretary.

(The guard above requested was promptly furnished, and all access to this spring, which was a source of typhoid fever, prevented.) B. L.

26.—ORDER FORBIDDING THE SALE OF FLOOD SOAKED FOOD.

JOHNSTOWN, 1889.

Important Notice.

The State Board of Health forbids the sale or use, for the purpose of food, of any articles which were submerged during the late flood, unless such articles were in hermetically sealed packages.

(Signed) BENJAMIN LEE,
Executive Officer.

27.—ORDER TO ABATE SPECIAL NUISANCE.

JOHNSTOWN, *July 27th*, 1889.

You are hereby notified to abate and remove, within twenty-four hours, a nuisance consisting of a foul pig-pen.

In order to abate this nuisance, it is ordered that the pigs be removed beyond the limits of Johnstown and adjoining boroughs, the pen torn down, and the place cleaned up and disinfected. You can obtain disinfectants free at 370 Bedford Street. Failure to obey this order will subject you to confiscation of the pigs and a fine of $20.00.

By order of the Board

(Signed) BENJAMIN LEE,
Executive Officer.

28.—WARNING TO DEALERS IN FERTILIZERS.

OFFICE OF STATE BOARD HEALTH, *July* 27-89.

MR. ----,

DEAR SIR:—It has been reported to the Board that you intended placing commercial fertilizers (phosphates, bone dust, etc.) in your ware house on Willow street. In order to save you inconvenience, I warn you that the presence of such offensive material in so populous a neighborhood or anywhere within the borough limits will be declared a nuisance and its removal at once ordered.

Yours respectfully,

(Signed) BENJAMIN LEE,
Executive Officer.

DEAR SIR:—On July 27 this office warned the dealers in fertilizers doing business in Johnstown borough, not to store any of this stock in the borough, and notified them that the storage of any such material

would be condemned as a nuisance and its immediate removal required. This regulation is still in force and will be faithfully carried out by the State Board of Health. Although these materials are so offensive as to become nuisances when stored in thickly settled districts, yet their sale is necessary and should be limited.

In order to protect the comfort and health of the public and at the same time not oppose unnecessary obstructions to trade, the Board suggests that the several dealers in fertilizers jointly erect a warehouse for the storage of this commodity outside the populous districts.

An unobjectionable location would be the point, at the junction of the Stonycreek and Conemaugh rivers where it is understood, ground could be procured for the purpose. Any other similar location will be satisfactory to the Board. Trusting that a speedy compliance with these regulations of the Board will prevent any unpleasant proceedings.

Yours respectfully,

BENJAMIN LEE,
Secretary and Executive Officer.

29.—SANITARY CONDITION OF PEELORVILLE.

August 3, 1889.

Mr. Joseph Masters, Superintendent of Real Estate Cambria Iron Company.

DEAR SIR:—A house-to-house inspection of the village of Peelorville on Prospect Hill, made under my instructions, developes the alarming fact that a large majority of the privies of the Company's houses are in very bad sanitary condition, many of them over-flowing.

The daily reports of physicians show an extensive and increasing prevalence of diarrhoea and malarial disease of a serious and often fatal type.

In view of this condition I cannot urge upon you too strongly the importance of having all the privies attached to these houses carefully examined and such as are not found in perfectly good condition cleaned and disinfected. I will furnish upon requisition from you such disinfectants as may be needed.

I have the honor to be yours, very respectfully,

BENJAMIN LEE,
Secretary and Executive Officer.

30.—EXTRACT OF LETTER FROM CAPTAIN HAMILTON SHOWING DISTRIBUTION OF LABOR CORPS.

JOHNSTOWN, PA., *July* 16*th*, 1889.

Dr. Benjamin Lee, Secretary State Board of Health.

MY DEAR SIR:—I thank you most heartily for the encouragement conveyed in your valued favor of the 14th instant.

Its contents have been carefully weighed and I assure you I shall act most cheerfully on your suggestion on this matter.

It is my desire to conduct the work here in exact accord with your wishes, and with the force directed in the cheapest and most efficient manner.

The force at the present time is equalized as follows:

Four forces of 25 men each (100) men cleaning out the débris back of Alma hall and Market street. Four forces 25 men each (100 men) on Walnut street. Three forces 25 men each (75 men) along Vine Street. One force of 35 men on the dump on the Point. One force cleaning up the morgue in Millville borough. One force 25 men finishing the débris in Washington street. The wagons are so distributed by direction given from time to time during the day as to keep them constantly employed.

This direction cannot be definitely laid down, as the material to be removed varies so much in regard to composition, at times being very easy to handle when the wagons can be loaded with great rapidity. At other times it is very difficult to handle, and consequently, requires more time for loading.

We then have 150 men in gangs of 10 men each, cleaning cellars and yards as directed from your office.

I have at this time 220 cellars that are reported from your office, in a bad sanitary condition that have not been cleaned. This would employ the present force on cellars, allowing two days for each cellar, which is about the average time required, 40 days.

I would like very much to have you go over the work with me on your return, and then I will reduce the force to any data you may direct.

I am,

Most truly yours;

(Signed) GEORGE C. HAMILTON,
Chief Engineer.

32.—DAILY EXPENSES OF SANITARY CORPS.

JOHNSTOWN, *August 6, 1889,*

67 Franklin Street.

Chief Medical inspector, W. E. Matthews	$15 00	
Clerks, F. D. Jolly,	4 00	
M. E. Bennett,	4 00	
Messenger, L. Zubrode,	1 00	
		$24 00
Saddle horses, R. T. Elder,	$1 75	
W. E. Matthews,	1 75	
		3 50

Park Building.

Deputy Medical inspector, H. F. Tomb,		10 00

Sanitary Office, Lincoln Street.

Clerks, F. V. Robinson,	$4 00	
J. E. Sill,	3 50	
General foreman, R. T. Elder,	4 00	
Messenger, F. Schubert,	1 00	
		12 50

Foreman, A. A. Shafer,	$2 50	
D. E. James,	2 50	
W. Fitzgerald,	2 50	
		7 50
Laborers, 24 men,		36 00
1 cook, Hubert Anderson,	$2 50	
1 boy, D. H. Lavely,	1 00	
		3 50

Cemetery.

Laborers, 2,	$1 50	
		3 00

Camp Mac.

Foreman, J. McMichael,	$3 00	
1 cook, A. Kendall,	2 00	
2 assistant cooks, Smith ($1.50) and Blackney ($1.50),	3 00	
1 police, D. T. Hill,	2 00	
		10 00

Disinfecting Depot.

Laborer, W. C. Wright,		1 50
2 horse teams, Cochran, 1,	$5 00	
Glenn, 1,	4 50	
Boyer, 1,	4 50	
		14 00
Carts, Griffith, 2,	$6 00	
Cuit, 1,	3 00	
Reese, 2,	6 00	
Adams, 2,	6 00	
Cochran, 1,	3 00	
		24 00
		$149 50

Kernville.

Deputy Medical inspector, Geo. Wagoner,	$10 00	
Clerk and timekeeper, H. E. Baumer,	3 00	
Messenger, D. Howard,	1 00	
E. Wakefield,	1 00	
		15 00
Foremen, J. C. Devine,	$2 50	
B. Romig,	2 50	
C. Wakefield,	2 50	
		7 50
Laborers, 22 men,	$1 50	
		33 00

Teams.

2 horses, Robb, 2,	$9 00	
Livingston, 1,	4 50	
1 horse, Louther, 1,	3 00	
Carts, Yeller, 1,	3 00	
Jno. Kelly, 1,	3 00	
Saddle horse, Jno. Graham,	1 75	
		24 25
		79 75

33.—CORRESPONDENCE WITH REGARD TO ENGINEERING WORK ON THE RIVERS,

(a.) *Letter to James McMillan, Esq., Chairman of the Finance Committee.*

JOHNSTOWN, PA., *July* 26, 1889.

James McMillan, Esq., Chairman Finance Committee, Johnstown, Pa.

DEAR SIR:—In response to your esteemed communication just received, in reference to the construction of "a dyke at the eastern border of Woodvale," I am reluctantly compelled to disallow the work. The question is purely an engineering, and not a sanitary one. It opens up and involves the whole problem of the protection of Johnstown and the neighboring boroughs from floods of the future. This, the State Board of Health cannot undertake, and indeed, there is reason to doubt whether the constitution will permit any department of the State Government to do so. The aid of the United States Government must be sought, for deciding the necessary measures and carrying on the work of this great, but essential, undertaking. My own judgment, after a careful survey of the whole flooded region from South Fork dam to Morrellville, is that homes should henceforth be placed upon the sides and summits of the hills, and the river bottoms be reserved for business and manufacturing purposes. A system of street railroads and inclined planes will make this perfectly feasible, and the time occupied in going from home to the place of work or business, need not be half as long as that similarly spent by the citizens of New York, Philadelphia, or any other large city. I cannot express myself too strongly in urging the good people of Johnstown, whose welfare is so near my heart, to pause before erecting residences again in these exposed locations.

I have the honor to be, dear sir,

Yours very truly,

(Signed) BENJAMIN LEE,
Secretary.

(b.) *Letter to President Harrison.*

JOHNSTOWN, *July* 27, 1889.

To His Excellency, Benjamin Harrison, President of the United States.

DEAR SIR:—The extreme urgency of official duties in connection with the disaster which has befallen this town, has prevented my earlier acknowledgement of your kindly expressed interest in my efforts to prevent an epidemic, as a result of the flood. Your suggestion of temporary deportation of women and children was most timely, and was acted upon as far as possible. I take the liberty of enclosing my health bulletins up to the present time, which will show you that the efforts

Foreman, A. A. Shafer, ...
D. E. James, ...
W. Fitzgerald, ...

Laborers, 24 men, ...
1 cook, Hubert Anderson, ...
1 boy, D. H. Lavely, ...

Cemetery.

Laborers, 2, ...

Camp Mac.

Foreman, J. McMichael, ...
1 cook, A. Kendall, ...
2 assistant cooks, Smith ($1.50) and Blackney ($1.50), .
1 police, D. T. Hill, ...

Disinfecting Depot.

Laborer, W. C. Wright, ...
2 horse teams, Cochran, 1, ...
Glenn, 1, ...
Boyer, 1, ...

Carts, Griffith, 2, ...
Cuit, 1, ...
Reese, 2, ...
Adams, 2, ...
Cochran, 1, ...

Kernville.

Deputy Medical inspector, Geo. Wagoner, ...
Clerk and timekeeper, H. E. Baumer, ...
Messenger, D. Howard, ...
E. Wakefield, ...

Foremen, J. C. Devine, ...
B. Romig, ...
C. Wakefield, ...

Laborers, 22 men, ...

Teams.

2 horses, Robb, 2, ...
Livingston, 1, ...
1 horse, Louther, 1, ...
Carts, Yeller, 1, ...
Jno. Kelly, 1, ...
Saddle horse, Jno. Graham, ...

of supplies that will be required, in case of a request being made by the Governor.

I am sir,
Very respectfully,
Your obedient servant,
JOHN B. HAMILTON,
Supervising Surgeon-General, M. H. S.

(e.) *Circular of the U. S. Treasury Department on Appropriation for Epidemics.*

WASHINGTON, D. C., *August* 9, 1882.

To Medical Officers of the Marine-Hospital Service and Officers of State and Municipal Boards of Health:

I am directed by the Secretary of the Treasury to inform you that Congress, at its last session, enacted that-

"The President of the United States is hereby authorized, in case of a threatened or actual epidemic, to use a sum not exceeding one hundred thousand dollars, out of any money in the Treasury not otherwise appropriated, in aid of State and local boards, or otherwise in his discretion, in preventing and suppressing the spread of the same."

He further directs me to inform you that the President has decided to employ this contingent appropriation through the agency of the Treasury Department, and that, in case of a threatened or actual epidemic, immediate action will be taken, upon application from the Governor of a State addressed to the Secretary of the Treasury.

JOHN B. HAMILTON,
Supervising Surgeon-General, U. S. Marine Hospital Service.

(f.) *Letter to Supervising Surgeon-General Hamilton.*

JOHNSTOWN, *August* 5, 1889.

Dr. John B. Hamilton, Supervising Surgeon-General, U. S. M. H. S.

DEAR SIR:—Yours of the 2d enclosing circular in regard to the mode of disposition of the emergency appropriation received. In reply to your inquiry as to what particular diseases I fear an epidemic of, in the case of a portion of the site of Johnstown being again under water, I would say typhoid fever, malarial fevers of a low grade and that form of pneumonia which is usually called typhoid pneumonia. Typhoid fever is already manifesting itself in the valley, and I am confident that it would commit serious ravages should even a very moderate flood again submerge these towns.

I have the honor to be,
Yours respectfully,
(Signed) BENJ. LEE,
Secretary.

(g.) *Letter from Supervising Surgeon-General Hamilton.*

WASHINGTON, *August* 13, 1889.

Doctor Benjamin Lee, Secretary State Board of Health, Johnstown, Pa.

SIR:—Referring to the matter of the epidemic fund and of its use in dyking the Conemaugh, I have to say that it is not contemplated that the appropriation should be used for such purposes.

Respectfully yours,

JOHN B. HAMILTON,
Supervising Surgeon-General, M. H. S.

(h.) *Letter to the Pittsburg Post.*

JOHNSTOWN, *July* 30, 1889.

To the Editor of the Pittsburgh Post.

DEAR SIR:—In a recent editorial on the subject of "Congressional Aid for Johnstown," you say: "If the aid which it is said will be solicited from Congress is a necessity, then it is the duty of the state, in the exercise of its general police powers which Governor Beaver invokes, in clearing away the débris, to provide the needful money." Allow me to call your attention to a slight error in this statement. It was not the "general" police powers but the "sanitary" police powers, which the Governor invoked for this purpose. To quote from the last official bulletin of the State Board of Health, a copy of which I take the liberty of enclosing for your consideration, "With the object of the protection of the public health directly and solely in view, the immense work which the state has accomplished in the Conemaugh valley has been prosecuted. Without the authoritative declaration of this board that the conditions here existing constituted a menace to the public health, not a shovelful of earth could have been thrown up, not a pick could have been used, not a blast could have been exploded, *at the expense of the state.*

"Enormous masses of débris have been removed—not in order to give the people an opportunity to re-establish their business or re-build their homes, but in order to remove the bodies of drowned persons, the carcasses of animals and other putrefying matter which they concealed, and which, if left undisturbed, would undoubtedly have bred disease. The huge and densely packed drift at the stone bridge has been rent asunder and dragged out—not in order to restore the river to its natural course, but to extricate offensive material entangled in and buried under it, *which would have contaminated the water supply of cities nearly a hundred miles distant.* Miles of public streets have been opened up and made passable—not in order to enable traffic to resume its course, but to create thoroughfares through which the wreckage and filth which was being removed could be transported to a safe distance. Some cellars have been cleaned—not as a gratuity to their owners, but because the

material contained in them was of so offensive a character as to make them fit places for the growth of death-bearing germs. However deeply, therefore, the members of the board may sympathize with individual sufferers—however strongly their hearts may prompt them to render aid in special cases—the board must be governed by this one inflexible rule—that it will authorize no stroke of work not distinctly sanitary in its object—otherwise it will be false to the purpose of its creation and subject itself to more than criticism."

Whether therefore, the state can authorize the dredging and widening of the streams in this valley, without an amendment to the constitution, depends entirely upon whether this work can be construed into being of a sanitary character. The board does not see its way clear to placing such a construction upon it. It is therefore, earnestly to be hoped that the public press of Pennsylvania will use its vast influence to mould public opinion, both in and outside of the state, in favor of the extension of aid by the National Government in this matter. That the Government does not consider it outside of its prescribed powers, is sufficiently demonstrated by the fact of its having already built several bridges here. The authority to build a bridge would convey the authority to protect that bridge from destruction, by making certain modifications of the river bed.

I have the honor to be,

Yours respectfully,

(Signed) BENJAMIN LEE,

Secretary.

(i.) *Communication from the Johnstown Board of Trade.*

JOHNSTOWN, PA., *August* 20, 1889.

Dr. Benjamin Lee, Secretary State Board of Health, Johnstown, Pa.

DEAR SIR:—At a meeting of the Johnstown Board of Trade, held Monday evening August 19, 1889, the following preamble and resolutions were unanimously adopted:

WHEREAS, The highways and cellars in Woodvale and Millville are in the same condition to-day as they were when the flood of May 31st had done its terrible work, and

Whereas, The cellars and highways are filled and covered with all kinds of filthy matter, which is detrimental to the health of the citizens of these municipalities and to those below us, who use the water in the Conemaugh river, as the embankments are washed away, and the channel of the river often runs through this unhealthy matter; therefore be it

Resolved, That the Governor and the State Board of Health be requested to have those highways and cellars cleaned, and to turn the channel of the river to its proper course, so far as to protect the health of the people.

Resolved, That the Secretary be directed to furnish a copy of these resolutions to the Governor and to Dr. Lee, Secretary of the State Board of Health.

Very respectfully,
(Signed) JAMES QUINN,
President Johnstown Board of Trade.

GEO. W. WAGONER,
Secretary.

(k.) *Reply to the Johnstown Board of Trade.*

JOHNSTOWN, *August* 21, 1889.

James Quinn, Esq., President Johnstown Board of Trade.

DEAR SIR:—I have the honor to acknowledge the receipt of your esteemed favor of the 20th instant, enclosing the resolutions of the Board of Trade of Johnstown, with regard to the condition of Millville and Woodvale. I find myself, however, compelled to dissent from the conclusion arrived at by your honorable body, that the cellars and high ways in those boroughs are "filled and covered with all kinds of filthy matter." I have personally inspected those districts many times and have found little beside clean sand and gravel deposited upon the surface. My own advice would be, instead of removing any of this deposit, to take advantage of the elevation of grade which it has afforded, and to raise the entire level of those boroughs correspondingly. I regard any general removal of earth not rendered positively necessary by its unhealthful condition, as an injury and not a benefit, to the town.

I have the honor to be, dear sir,
Yours very respectfully,
(Signed) BENJ. LEE,
Secretary.

34.—REDUCTION OF THE SANITARY CORPS.

JOHNSTOWN, *August* 7, 1889.

Dr. W. E. Matthews, Chief Medical Inspector.

DEAR SIR:—You are hereby authorized and instructed to reduce the force of the sanitary corps in Johnstown from and after Saturday, August 10th, 1889, to the following basis:

1 Chief Medical Inspector, W. E. Matthews, Johnstown; 1 Medical Inspector, (half time) G. E. Wagoner, Kernville; 1 clerk and typewriter, executive office; 1 messenger, executive office; 1 clerk, sanitary office; 1 foreman and nuisance inspector; 10 disinfectors (laborers); 2 double teams; 2 carts for distributing disinfectants, the horses to be used half of each day with the sprinkler, and the other half in the disinfecting carts or wagons; 1 cook; 1 table boy; 1 policeman; 1 saddle horse.

Camp "Mac." to be given up, and used for the storage of coffins. The Prospect Hill cemetery men to be discharged, and notice to that effect to be placed in the daily papers at once. Cochran's team to be discharged.

Yours very truly,
(Signed) BENJ. LEE,
Secretary.

35.—CORRESPONDENCE WITH REFERENCE TO THE POLLUTION OF RIVERS.

(a.) *Communication from the Cambria County Medical Society.*

JOHNSTOWN, *September* 23, 1889.

Benjamin Lee, M. D., Secretary State Board of Health.

DEAR DOCTOR:—Johnstown and the surrounding boroughs are, as you know, without a local board of health; heretofore, when questions concerning the sanitary condition of these boroughs were brought up, it has been customary for a committee of the local physicians to make such investigation as the case required, and recommend such measures as they might deem proper. This much to account for the action of our County Medical Society at a meeting held this week.

The question concerning the condition of our rivers was debated at considerable length, the out-come of which was the appointment of this committee.

We fully realize the magnitude of the task that has fallen to your Honorable Board by reason of the great flood; we also realize with what promptitude and eagerness you grappled the task, fully alive to the necessities of the occasion; you have labored night and day, and with results that no one is better able to appreciate than your humble committee.

The great distress of almost every household during the weeks succeeding the flood over the loss of friends and property, prevented much thought for the future, but later this new anxiety forced itself upon them, and now confronts them with almost hopeless terror.

The cleaning of cellars, streets, etc., is progressing rapidly and well: but what of our rivers?

It has come to us that they will remain as they are. Perhaps we have been misinformed; we hope that we have; however, in order to ascertain their true condition, this committee has made a very careful inspection on foot, along the banks and in the débris in the course of the Stony creek and Conemaugh rivers.

Beginning at a point near Sandy Vale cemetery on the Stony creek, we proceeded down the stream; we found the sewer outlets from the seventh ward, near the Poplar street bridge, throwing out their filth against logs and other débris which obstructed its flow down the stream. But it is at a point near the Moxham station on Bedford street,

that the sickening spectacle begins. On the south side of the river a slaughter house pouring out its refuse fifty feet from the waters edge, only to lodge against logs and other rubbish. Further down on the Johnstown side, from Bedford street to the Franklin street bridge, is a bed of disease breeding filth, locked in by logs, stumps, roots etc., washed there by the flood, so interwoven that, in our opinion, no flow of water which this stream is capable of furnishing can ever remove them. The Clinton street sewer empties its accumulation into this mass and emits a stench that is truly horrible. At this point the stream is more than one half obstructed in the manner described.

Below the Franklin street bridge the same state of affairs exists: the private sewers along the bank empty directly on top of obstructions that render its free passage down stream impossible.

On the opposite side of the stream the Morris street, Napoleon street and Sherman street sewers are emptying out their filth into a quarter of an acre or more of loam, interlocked with bridges, roots and logs, and we feel safe in saying that the outflow from these sewers for the past three months remains there and has never reached the water's edge. Further down the stream the obstructions are even worse, and at a point opposite the foot of King street, the river is more than two thirds obstructed by cars and other débris. At the foot of Vine street, the Vine street sewer is obstructed at its outlet, and the out-flow is obliged to make its way seventy five feet, through rubbish, to the water's edge; the outlet of the Lincoln street sewer is in like condition, except that the refuse matter must find its way up stream, fifty feet, to water. The point of the outflow of the Main street sewer is worse than the others, like the last, it must find its way up stream. Below these sewers, the river is greatly obstructed with all kinds of débris, to a point below the Cambria City bridge.

Proceeding up the Conemaugh, we found the sewers from Millville obstructed, but not so filthy as the others; this is owing to the fact that very few people are living there, and the sewers are not much used; indeed the Conemaugh presents very little obstruction above the Lincoln bridge, and only one point, where the Prospect Hill sewer empties, is filthy; the other sewers, from Conemaugh borough and Woodvale are open and free.

Now doctor, what can we do with this existing state of affairs? Is it not truly horrible, surrounded as we are by these great accumulations of filth, out flow from sewers, decomposing human bodies, animal and vegetable matter, in a word, all the factors for breeding disease directly at our garden gates, under our dining room windows and at our very doors? We might go to our local authorities, but in their crippled and unstable condition, the task could never be performed. Therefore, it is to you and the State Board of Health, that we must appeal.

We know, full well, that this state of affairs has not escaped your vigilant eye.

We know that the work will be great and difficult, but the lives and health of thousands of sufferers appeal to you, to take measures to remove this cloud. We ask that you have a thorough investigation of the rivers made, and see if they should not be condemned and these obstructions removed, and we offer you our hearty co-operation and assistance, and trust you will call upon us at any time our services are needed.

Yours respectfully,
(Signed) J. C. SHERIDAN,
W. B. LOWMAN,
F. SCHILL.
Committee.

(b.) *Reply by the Secretary of the State Board of Health.*

JOHNSTOWN, PA., *Sept.* 15, 1889.

To Drs. J. C. Sheridan, W. B. Lowman and F. Schill, Committee of the Cambria County Medical Society.

GENTLEMEN:—I have the honor to acknowledge the receipt of your esteemed communication of yesterday in reference to the condition of the rivers on the banks of which Johnstown stands, from a sanitary point of view. Your kindly expression in regard to the value of the work of the Board in its efforts to prevent disease as a result of the disastrous flood which has recently overwhelmed your town are gratefully appreciated. Begun at the call of duty, it has been continued as a labor of love, and the commendation of those who are able to judge intelligently of its character is an ample recompense. The report of your inspection I have read with great care, and have taken pains to go over the ground myself in order to personally verify the soundness of your observations. I believe them to be correct, and acquiesce in the justice of your conclusion that the conditions existing in the Conemaugh and Stony creek rivers, but more particularly the latter, owing to obstruction of their natural channels by drift and wreckage, and especially to such obstruction near the outlets of the sewers, constitute a serious menace to the public health. I therefore authorize Captain Hamilton to employ a portion of his force in removing these obstacles, to such an extent as will permit of the free flow of the sewage and prevent the formation of the stagnant and offensive pools which now exist. It must not be understood that these operations will be conducted with a view to the improvement of the rivers. The Stony creek I look upon as simply an open sewer, and I authorize work upon it only to enable it to perform its function in that respect. At the same time with the inception of this undertaking, I shall issue a bulletin calling the attention of your people to the necessity for co-operating with the Board to keep the rivers as free as possible from pollution. You can readily understand that it will be of

little use for the State to cleanse the stream and remove impediments to its free flow if they are continually throwing all manner of refuse into it and damming it up with fresh obstacles. I therefore accept at once your kind offer of assistance in requesting you to use your influence in preventing the continued use of the river bed as well as its banks as a dumping ground for household refuse. The board has been endeavoring to teach the lesson that fire is the great purifier. An immense amount of putrescible material is thrown out into the yards and streets and into the river, where it becomes an offense to every sense, which might easily be consumed in the kitchen stove. Such a disposition of it would greatly lessen the expense of garbage collection, and materially improve the health of the community. I have the honor to be Gentlemen,

Yours respectfully,
(Signed) BENJAMIN LEE, *Secretary.*

(c.) *Letter of Instructions to Captain G. C. Hamilton, Chief Engineer of Johnstown.*

JOHNSTOWN, PA., *Sept.* 14, 1889.

Captain George C. Hamilton, Chief Engineer, Johnstown.

DEAR SIR: An inspection of the Conemaugh and Stony creek rivers made in company with yourself and Medical Inspector, Dr. Matthews, leads me to conclude that, at the present low stage of their waters, the obstructions left by the flood have produced a degree of stagnation, which, combined with the filthy character of much of the wreckage and sewage which is constantly emptying into them, constitute a serious danger to the health of the town. I therefore condemn this condition as a nuisance, and authorize you to employ such force, not to exceed two hundred and fifty men, as may be necessary to remove and destroy all bedding, clothing, and other filthy material in the waters or in the beds of the streams, to remove all obstacles to the free escape of sewage into the channel from the mouths of the sewers, and to remove from the channel itself ten feet on each side of its middle line, such obstructions in the shape of roots, stumps and wreckage as interfere with the flow of sewage and produce stagnation along the shores. I desire that that work should be planned not to continue more than two weeks from the present date.

I have the honor to be,
Dear Captain,
Yours respectfully,
(Signed) BENJAMIN LEE,
Secretary.

(d.) *Extract from a letter to Governor Beaver.*

JOHNSTOWN, *September* 14, 1889.

To His Excellency Governor Beaver:

DEAR SIR:—I have the honor to report that in company with Chief Engineer, Captain George C. Hamilton, I have to-day made an inspection of the work now in progress in abating the nuisance at this place. I find that great progress has been made during the past ten days, much very offensive matter having been removed and the places whence it was taken, disinfected. During the last thirty-six hours, five dead bodies have been taken out, four of them near the late residence of Mr. Linton on Main street. I think it desirable that the force employed on this work should be continued without diminution. The shrinkage of the water in the rivers, and especially in the Stonycreek, develops a new danger to the health of the community in the retardation of the current by masses of débris, and the consequent formation of foul and offensive pools. This matter has been formally brought to my attention by a committee of the Cambria County Medical Society, who have presented a written report upon the subject, and also waited upon me personally, to urge its consideration. The retention of a large amount of sewage and its soakage into bedding and clothing, considerable quantities of which encumber the stream are evils which demand prompt interference. I have, therefore, authorized Captain Hamilton to put on an additional force, with instructions to remove and destroy all such foul accumulations, to remove obstacles to the free escape of sewage into the channel from the mouths of the sewers, and to remove from the channel itself, such obstructions in the way of roots, stumps and wreckage, as interfere with the escape of this material and produce stagnation. This work is not to be undertaken with any view of dredging the river, lowering its bed, or preventing floods, but simply to allow the escape of these fetid accumulations.

I have the honor to be,

Yours very respectfully,

(Signed) BENJ. LEE,

Secretary.

(e.) *Final Letter of Instruction to Captain Hamilton.*

JOHNSTOWN, *October 2d*, 1889.

Captain Geo. C. Hamilton, Chief Engineer.

DEAR CAPTAIN:—You are hereby authorized to employ such force of laborers not to exceed five hundred, and for such length of time not to exceed ten days, and not to extend beyond Saturday, October 12, as in your judgment may be necessary for the purpose of cleaning such cellars

as have been left partially cleaned, and no others, and of completing the work of opening the mouths of sewers on Stony creek river.

Yours very truly,
BENJ. LEE, *Secretary*.

36.—BULLETINS, FORMS, ETC., ISSUED BY THE BOARD AT JOHNSTOWN.

(a) Bulletin No. 1.
(b) Bulletin No. 2.
(c) Bulletin No. 3.
(d) Bulletin No. 4.
(e) Bulletin No. 5.
(f) Bulletin No. 6 (Circular of Information).
(g) Bulletin No. 7.
(h) Bulletin No. 8.
(i) Bulletin No. 9.
(j) Notice to Heads of Families.
(k) Circular Letter to Inspectors.
(l) Circular Letter to Surgeons in charge of Hospitals.
(m) Permit to transport body.
(n) Canvasser's Report.
(o) Badge.
(p) Meal tickets.
(q) Daily Report of Hospitals and Camps.
(r) Pass.
(s) Request for Transportation.
(t) Cellar Report.
(u) Voucher.
(v) Time Card.
(w) Pay Roll.

(a.) *Official Health Bulletin, No. 1.*

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *June* 9, 1889.

The general condition of health in Johnstown and vicinity is excellent. No epidemic disease of any kind prevails, nor is it expected that any will arise.

The whole region has been divided into convenient districts, and each placed under a competent sanitarian. The State Board of Health is prepared to meet all emergencies as they arise. The air is wholesome—the water generally pure.

If the good people of the devastated district will go on as they have so nobly done for the past week, in their efforts to clean up the wreckage, good health will *certainly* be maintained.

GEO. G. GROFF, M. D.

(b.) *Official.*

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *June* 10, 1889.

Health Bulletin No. 2.

Reports received at 8 o'clock last evening from the Inspectors of this Board show that the favorable condition stated in the first report con-

tinues. No contagious disease of any kind prevails. There are a few cases of a mild type of measles. No signs of any epidemic are manifest. The State Board of Health is fully prepared to meet all emergencies as they arise.

As a precautionary measure, a hospital for contagious diesases has been established, and if any cases appear they will be promptly met.

The air continues pure and wholesome, the water pure. The bodies still in the wreck are so covered with earth as not to be dangerous to health. There is every precaution being taken to prevent contamination of the water supply for the towns below Johnstown.

There is no ground whatever for alarm in this matter at present. The bodies in the river are covered with mud and earth, so as not to be dangerous to health.

The weather is cool and most favorable. Though the destruction of life has been appalling, there is at present every reason to be encouraged.

GEO. G. GROFF, M. D., *Member in Charge.*
BENJ. LEE, *Secretary and Executive Officer.*

(c.) *Official Health Bulletin, No.* 3.

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *June* 11, 1889.

SIR:—This Bulletin, compiled from official reports of Inspectors, practicing physicians, and hospital records, is made at 10 P. M., June 10th. The favorable condition stated in former reports continues. But one case of diphtheria and two cases of pneumonia are reported in the whole devastated region, *and not a single case of typhoid fever.* There is almost a phenomenal absence of sickness. Not a single case of dangerous illness is known to the Board.

The water supply, which is brought in iron pipes from mountain springs four and five miles distant, has been inspected by Dr. P. M. Carrington, of the U. S. Marine Hospital Service, and Dr. C. O. Probst, Secretary of the Ohio State Board of Health, and pronounced as pure as before the flood.

There is no general pollution of the atmosphere by effluvia dangerous to health, as nearly all bodies are covered with mud, which, drying, acts as a disinfectant and absorber of gasses. The numerous large fires of burning débris keep the air in rapid motion. The comparatively low temperature which has prevailed has also contributed to maintaining its purity.

The total number of cases treated by the Bedford street hospital staff, either at the hospital or at their homes, has been ninety-six (96). Of these five (5) have been injuries of various kinds, generally not of a serious nature. thirty-two (32) disturbances of digestion, two (2) pneumonia, seven (7) nervous prostration; thirteen (13) measles, and the remainder slight colds.

The State Board of Health is greatly encouraged in its work, and feels able to meet each emergency as it may arise.

BENJAMIN LEE, M. D.,
Executive Officer.
GEO. G. GROFF, M. D.,
Member of Board.

We, from personal study of the situation, affirm the truthfulness of the above report.

P. M. CARRINGTON, M. D.,
Surgeon U. S. Marine Hospital Service.
C. O. PROBST,
Secretary Ohio State Board of Health.

(d.) *Official Health Bulletin, No. 4.*

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *June* 13, 1889.

The favorable condition stated in former reports continues. No case of typhoid fever is reported to the board. Measles and mumps are reported. Two additional cases of diphtheria are known to exist, and have been isolated, and the spread of this disease is not anticipated. The temperature is low this morning, and the air remains wholesome.

If the people will continue to clean up about their homes, and to thoroughly disinfect the premises, no danger of any more sickness exists than could reasonably be expected.

The State Board of Heath feels that the papers which have been publishing the sensational reports concerning the presence of contagions here, and which suppressed the names of Dr. P. M. Carrington, P. A., Surgeon United States Marine Hospital Service, and of Dr. C. O. Probst, Secretary of the Ohio State Board of Health, which were appended to report No. 3, cannot be too highly censured by an outraged public. The only aim of these papers seems to be to create a panic and to increase the sufferings of an already sorely afflicted people.

BENJAMIN LEE, M. D.,
Executive Officer.
GEORGE G. GROFF, M. D.,
Member of Board.
W. E. MATHEWS, M. D.,
Inspector.
C. SHERIDAN, M. D.,
Deputy Inspector.
W. B. LOWMAN, M. D.,
Deputy Inspector.
J. C. SHERIDAN, M. D.,
Deputy Inspector.
GEORGE W. WAGONER, M. D.,
Deputy Inspector.

(e.) *Official Health Bulletin No. 5.*

STATE BOARD OF HEALTH,
JOHNSTOWN PA., *June* 19, 1889.

Since the issue of the last bulletin there has been a gradual improvement in the health of Johnstown and outlying boroughs. Coopersdale is still so difficult of access, owing to high water in the Conemaugh, that it has been a matter of great difficulty to keep the people supplied with the necessaries of life. Hence we have reported from there a slight increase in affections of the stomach and bowels. It is desirable that means should be taken to establish more direct and easy communication with that village.

The last report from the Bedford Street Hospital shows no new cases. Twenty-one dispensary cases had been treated in the course of the day, twelve of which were slight injuries. No contagious diseases. The Red Cross hospital for contagious diseases reports one case of diphtheria discharged, cured; one case of diphtheria terminated fatally; at present in hospital, one patient with erysipelas and a number of cases of measles. Thirteen dispensary cases treated.

Major Silliman, Chief Medical Officer of the National Guard, reports the health of the command excellent, not one soldier off duty. The death of a child four years old is reported from Morrellville, cause not stated. Also of a child in East Conemaugh from accidental poisoning. Measles is diminishing, being decidedly less prevalent than before the flood in proportion to the population. No other contagious disease is reported.

Two details are at work collecting garbage and cremating the same with rosin, a very acceptable donation of which has been received from Wilmington, N C. Details patrol the river below the stone bridge night and day to arrest all putrefying matter set free from the drift. Yesterday five bodies were thus reclaimed, and many carcases of animals dragged out and cremated.

The Sanitary Corps is doing very efficient work under its local inspectors, the force numbering about two hundred men. The general depot for disinfectants is now at 370 Bedford street. There are fifteen sub-stations, which are kept constantly supplied, and to which the residents make frequent applications. Much admirable work is being accomplished by the citizens themselves in putting their own properties in good sanitary condition.

The Board URGENTLY RECOMMENDS the use of lime for whitewashing cellars, water-closets and fences, and scattering in all damp places A good supply has been received by the Board and can be had FREE at the following places: Corner of Main and Adam street; No. 67 South street, Kernville; Second Lutheran Church, Hornerstown; corner of Main and Franklin streets; corner of Franklin and Vine streets; at

Headquarters, No. 370 Bedford street, and at all other sanitary stations. We urge everybody to get and use this lime at once. Bring vessels to carry it away.

BENJAMIN LEE, M. D.,
Executive Officer.
GEO. G. GROFF M. D.,
Member of Board.
W. M. MATTHEWS, M. D.,
Inspector.
GEO. W. WAGONER, M. D.,
Deputy Inspector.

(f.) *Official Health Bulletin No. 6.*

IMPORTANT CIRCULAR OF INFORMATION.

Although the public health is excellent, and no danger of any outbreak of sickness is anticipated, it is important that the people of Johnstown and surrounding villages should be instructed as to the means of maintaining the present condition of general good health. The *State Board of Health* for this purpose issues this circular.

The houses should be kept open as freely as possible, so as to dry them. It would be well to keep fires burning in all the houses to dry them and to prevent dampness. All dampness and mould must be banished as soon as possible. Hence all wet carpets, clothes, blankets, etc., etc., should be washed and hung out to dry without any delay whatever. Collections of wet carpets, blankets, etc., must not be permitted. Cellars should be as thoroughly cleaned as possible, and the windows kept constantly open. The cellar floor should be well sprinkled with a disinfectant. Be sure to clean out all the corners in the cellar *thoroughly*. Don't leave any dirt in it. Whitewash as soon as you can get lime. Clean up the yard and burn all the rubbish soon as possible. Don't save the wood, but burn it. All decomposing vegetables and meats should be thoroughly burned. Disinfectants should be freely used in and around privies.

Personal cleanliness should be carefully attended to. Bathe the body daily. Eat plentifully of the best food you can secure. Keep in as good spirits as possible. Sleep in a room with the windows wide open, though draughts of air should be avoided. Beds should be supplied with blankets rather than sheets, for health, and the body should always be covered at night, though but lightly when it is very warm. The clothing should be kept clean. All underclothing should be washed as at ordinary times.

The city water from the mountain springs is the best There is *absolutely no danger from it* Well water should not be used. It would

be well to boil river water used as a beverage or for culinary purposes before using it. It would be well for all women and children who can to go for a few weeks into the country or to the homes of friends at a distance. This will relieve overcrowding and do great good.

Medicines and medical relief can be had at the Bedford street Hospital by the destitute. Chemicals and all disinfectants free at the Depot of the State Board on Bedford street, No. 368. The State Board of Health is prepared to meet all needs of the inhabitants of the devastated district of a sanitary nature promptly. Headquarters at 55 Adam street.

By authority of the State Board of Heatlh.

BENJAMIN LEE, M. D.,
Executive Officer.
GEO. G. GROFF, M. D.,
Member of Board.

(g.) *Official Health Bulletin, No. 7.*

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *July* 23, 1889.

Since the issue of the last bulletin the only departure from the remarkably high standard of health which marked the period comprising the first three weeks after the flood in this valley, has been a tendency to diarrheal affections, often assuming the form of cholera morbus, less frequently than that of mild dysentery.

This is attributable to three causes—first, the intense heat which has succeeded the unusually low temperature of the month of June; secondly, the too free use of fruits and vegetables, often unripe or overripe, after the enforced rigid diet which prevailed immediately after the disaster—coupled with unusual exposure to the sun's rays during the day and dampness at night, thirdly, to the immoderate indulgence in intoxicating liquors which has prevailed since the removal of the judicial injunction on the sale of these beverages. Johnstown, however, is not the only place in the country where this tendency to bowel disorders has manifested itself, and it must be said that they have here generally yielded readily to appropriate treatment. The advantage which has resulted from the use of aromatic sulphuric acid, also called elixir of vitriol, in these cases, leads the Board to suggest that it would be well for every family to supply itself with a small phial of this remedy, and for each member of the family to take five drops once a day in a tumbler of water as a preventive. Of this strength it makes a delightful, refreshing drink, and should any trifling impurities have crept into the water through breaks in the pipes, it will entirely neutralize them. The fact that this tendency prevails more extensively and develops a more serious character in Peelorville than in other sections, leads the Board to temporarily condemn the use of the water from

the tank on Prospect Hill for drinking and culinary purposes. During the prevalence of this condition it would be a wise precaution also to boil all water to be used for drinking.

But one case of typhoid fever now exists in the town, and that has recently been imported from Pittsburgh. Over crowding still prevails to a serious extent in all outlying villages. It is hoped that this will be remedied before the advent of cold weather prevents the free ventilation which is now possible. The Board has this steadily in view in increasing the area on which portable houses may be placed, but it earnestly urges the citizens to refrain from bringing their families within the districts still proscribed. The inconveniences of tent or camp life are trifles compared with the miseries of a general epidemic of disease, such as would follow the sudden introduction of a large population into certain sections of the city.

The areas in Kernville on which the Board considers it unsafe to place portable houses have been revised, and are now as follows:

The square on the east side of Morris street, between Haynes and Dibert streets

The lots fronting on the east side of Morris street, from Dibert street to the residence of Joseph Kuntz, Esq.

The portion of the square on the west side of Morris street from the alley along lower end of Swank's Pottery down to Dibert street, including lots fronting on Morris, Dibert, and Napoleon streets.

The squares on the west side of Morris street to the hill, and from Dibert street to Haynes street.

The square from Haynes street to the river and from Napoleon street to the hill.

The lots fronting on Haynes street between Morris and Napoleon streets, and on Napoleon street from Haynes street to the river.

The lots fronting on the west side of Morris street between Haynes street and the residence of Joseph Morgan.

All other parts of the South Side are now open for habitation.

The restriction is removed from the entire Seventh Ward.

Modifications of the restricted areas in other districts have already been given to the public through the Finance Committee.

The impossibility of supplying the city lockup with water and its contracted dimensions constitute it a nuisance dangerous to the public health, and the Board therefore orders its immediate improvement in these particulars, or the removal of prisoners therefrom until such time as they can be accommodated properly.

The Board is especially desirous that the citizens of Johnstown should understand precisely the ground on which it is carrying on its operations in this and other flooded regions of the state. The Board is in no sense a relief commission. The constitution of the Commonwealth expressly forbids the state authorities to expend a single dollar for the benefit of private individuals. The sole business of the State

Board of Health is to take measures for the protection of the public health. With this object directly and solely in view, the immense work whch the state has accomplished in the Conemaugh valley has been prosecuted. Without the authoritative declaration of this board that the conditions here existing constituted a menace to the public health, not a shovelful of earth could have been thrown up, not a pick could have been used, not a blast could have been exploded, *at the expense of the state.*

Enormous masses of débris have been removed—not in order to give the people an opportunity to re-establish their business or re-build their homes, but in order to remove the bodies of drowned persons, the carcasses of animals and other putrefying matter which they concealed, and which, if left undisturbed, would undoubtedly have bred disease. The huge and densely packed drift at the stone bridge has been rent asunder and dragged out—not in order to restore the river to its natural course, but to extricate offensive material entangled in and buried under it, which would have contaminated the water supply of cities nearly a hundred miles distant. Miles of public streets have been opened up and made passable—not in order to enable traffic to resume its course, but to create thoroughfares through which the wreckage and filth which was being removed could be transported to a safe distance. Some cellars have been cleaned—not, as a gratuity to their owners, but because the material contained in them was of so offensive a character as to make them fit places for the growth of death-bearing germs. However deeply, therefore, the members of the board may sympathize with individual sufferers—however strongly their hearts may prompt them to render aid in special cases—the board must be governed by this one inflexible rule—that it will authorize no stroke of work not distinctly sanitary in its object—otherwise it will be false to the purpose of its creation and subject itself to more than criticism.

In the absence of a local board of health, the board, by virtue of the authority conferred upon it by the act of June 5, 1885, hereby adopts and promulgates for Johnstown and each of the neighboring boroughs the accompanying ordinance, entitled "The Model Ordinance" of the State Board of Health, "for the Better Preservation of the Public Health in Cities and Boroughs in Pennsylvania."

The board trusts that the authorities of the several boroughs, and the people as well, will give this ordinance their serious attention, that its provisions will be cheerfully and scrupulously complied with, and that it will eventually be adopted, with such trifling modifications as local circumstances may render expedient, as the Sanitary Code of the valley.

BENJAMIN LEE, M. D.,
Secretary and Executive Officer.
GEORGE G. GROFF, M. D.,
Member of Board.

(h.) *Official Health Bulletin, No. 8.*

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *September* 16, 1889.

The principal object of the board in issuing this bulletin is to call attention to the importance of preventing any unnecessary pollution of the rivers. At this season of the year fevers are apt to prevail. The low stage of water in the streams, coupled with the retardation of their current by flood débris at the present time, necessarily produces a certain amount of stagnation and consequent generation of foul gases. All decomposing animal and vegetable matter, of course, adds directly to this evil. A moment's reflection will also lead to the conviction that any solid object, such as a barrel, a piece of timber, or an article of clothing will add to the obstructions to the free flow of the water and afford a new point of arrest for the putrescent material. In view of the universally recognized tendency of such conditions to produce disease, the throwing or placing of all garbage or refuse and of any solid object into the waters or on the beds of the Conemaugh or Stonycreek rivers, save such as is legally permitted to pass through the sewers, is absolutely forbidden. The board trusts that all good citizens will appreciate the necessity for strict compliance with this order. Unless it can have the honest and hearty co-operation of the people in its efforts to preserve the public health, its labors will have been in vain.

The tendency to disturbances of the bowels, noted in the last bulletin, has happily disappeared. In the meantime, typhoid fever, originating at a farm house about two miles back in the country, has made its way first into the village of Moxham, which escaped the flood, and thence into the town. A spring and pump, to which several of the earliest cases appeared to be traceable, and to which the entire neighborhood resorted in preference to using hydrant water, were condemned by the board and the use of their water forbidden The number of cases has been considerable, although not large as compared with that of those occurring in other towns at the same time. The type of the fever has been mild, and the mortality very slight The reports of the past week show that its prevalence is decidely decreasing. This forms at present the only exception to the general good health of the community, which the board has every reason to anticipate will continue, if ordinary sanitary precautions are observed.

BENJAMIN LEE, M. D,
Secretary and Executive Officer.

(i.) *Official Health Bulletin, No* 9.

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *October* 12, 1889.

In issuing this, its last bulletin in reference to the health of Johnstown and the Conemaugh valley, as affected by the great flood, the

State Board of Health has its most serious obligation yet to perform---that of urging upon the people in the most emphatic manner the necessity and the duty of becoming themselves the protectors of the public health. If the success which has attended the efforts of the board to prevent the occurrence of a pestilence such as has invariably followed like disasters in the past, has impressed upon their minds this lesson: That accumulations of decomposing animal and vegetable matter near human habitations are always dangerous and never to be tolerated, and that in thickly settled regions the only way to avoid such accumulations is by the creation of specially constituted authorities charged with the duty of their prevention and removal, clothed with full power and provided with sufficient means to enforce their own regulations—the direct and immediate benefits which its presence here has conferred will be trifling compared with the far-reaching good which will have been thus indirectly accomplished. If, on the other hand, the effect of the assistance rendered by the state has unfortunately been to lessen the self reliance of the citizens, leading them to look outside for the performance of a function of self-government which belongs rightly to themselves alone, then the greatest work ever undertaken by a state board of health will have been prosecuted in this valley with the results which will be far from an unmixed good. If the simple precautions which the board have been exercising in the matters of sanitary inspection, disinfection and the removal of garbage are at once dropped, the board will not hold itself responsible for the consequences. The municipal authorities of all the boroughs lying along the Conemaugh and StonyCreek rivers should unite in constituting a board of health, to which should be confided the protection of the health of the entire district. The organization of this board should be on the plan authorized by the legislature for cities of the third class. It should consist of five of the most intelligent and reliable citizens, appointed without reference to locality or political preference, whose term of service should be limited only by their failure to properly perform the duties of the position. Such a board, adopting the model ordinance of the state board of Health as its code, and faithfully executing its provisions, would speedily become a pattern for all sanitary organizations thoroughout the commonwealth.

The board feels that it may well congratulate the citizens on the standard of health which has been maintained during this trying period in the face of so many adverse influences. Their cheerful acquiescence in the decisions of the board, which must often have appeared to them onerous, and their brave and resolute temper, have had a considerable share in conducing to this result. The secretary trusts that he will not be considered as overstepping the strict limits of official propriety if he expresses the regret which he feels personally in severing ties which for months have bound him so closely, under circumstances of such

unusual trial to the inhabitants of this devastated valley. The friendships which he has formed, however, will not, he trusts, be limited by time or space, but will continue to permanently enrich his future life. In whatever he may have failed in the full performance of his duty toward a people who elicited his warmest sympathies, he ventures to hope that the deficiency will not be attributed to lack of zeal or good intention. In the signs of reawakening energy and enterprise which meet his eye on every side on each recurring visit, he gladly reads a prophecy of renewed prosperity, and has faith to believe that a Providence, which so wonderfully preserved them amid a cataclysm of such unexampled proportions, will inspire them with the courage, determination, wisdom and virtue necessary to found a new city, which shall be grander and more enduring than that which was so suddenly and by so mysterious a decree swept out of existence.

BENJAMIN LEE, M. D.
Secretary and Executive Officer

(j.) *Notice to Heads of Families.*

The State Board of Health earnestly advises that all women and children in Johnstown and neighboring boroughs, and especially those who are living in overcrowded houses, or in houses which are damp and wet, or which are located on very low ground, should leave the place for a few weeks if they can possibly do so. The change will be in the highest degree beneficial. All who have lost their homes would be much more comfortable in tents than in overcrowded houses. Tent life is both healthful and pleasant.

The board therefore recommends that camps be established on the hillsides in dry locations and near good water supplies. Families could thus live comfortably all summer, and they would have opportunity to collect new home supplies to furnish their houses when renovated or rebuilt.

The board again urges upon the heads of families the imperative importance of cleaning the cellars of their houses of all mud and refuse and of strewing them freely with disinfectants, which they can obtain with full instructions for their use at the Sanitary Headquarters, 368 *Bedford street*, or at the local disinfectant stations.

BENJAMIN LEE, M. D.,
Executive Officer.
GEO. G. GROFF, M. D.
Member of the Board.

(k.) *Circular Letter to Inspectors.*

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *June* 10, 1889.

DEAR DOCTOR:—You will find the following information useful in supplying the needs of the people in your district:

When shelter is needed send an order to Colonel Hill, Pennsylvania Railroad station, for the requisite number of tents.

For medical supplies, to the Bedford street hospital.

For disinfectants, to the depot of Sanitary Corps, 368 Bedford street.

It is important, however, that you should at the earliest possible moment, establish a depot of disinfectants in your own district, which you can keep supplied from the general depot. Large placards are being printed for these district depots, and posters to be placed where you may designate, at numerous points, informing the public where these depots are. These will be ready tomorrow, and it is trusted that you will be prepared to use them.

For food and clothing, the order should be sent to Captain Kuhn, General Commissary.

The deportation of women and children is to be encouraged, and orders for transportation can be obtained of the Committee at headquarters.

Where parties live in damp localities or are unusually exposed, we suggest the daily use of a moderate amount of quinine as a prophylactic.

Supplies of all kinds are abundant. None need suffer.

Sign your orders as Deputy Medical Inspector, State Board of Health, and they will receive attention.

Circulars have just been issued by the board and widely posted throughout the town and outlying boroughs giving the public plain instructions as to house and personal hygiene. It will be well to supply yourselves with a considerable number of these and to distribute them in making your rounds.

In conclusion allow us again to call your attention to the prime importance of making full and precise reports to the Board each day, of the number of cases of disease discovered and of general sanitary condition of your district.

Yours respectfully,

(Signed) BENJAMIN LEE,
Secretary.
Geo. G. GROFF, M. D.,
Member of Board.

(l.) *Circular Letter to Surgeons in Charge of Hospitals.*

STATE BOARD OF HEALTH,
JOHNSTOWN, PA., *June* 10, 1889.

To the Surgeon in Charge of ———— *Hospital, Johnstown.*

DEAR DOCTOR:—The inevitable disorder attending the establishment of temporary hospitals in the face of so overwhelming a calamity as has just visited this recently beautiful and flourishing town, has now had time to measurably subside. It is desirable to take advantage of this fact to inaugurate at once in each of the several hospitals, dispensaries, and refuges that system and order, and especially that scrupulous attention to cleanliness which are the essential features of successful hospital administration.

These institutions may be needed for months, and the habit of irregularity and disorder, which necessarily marked their inception, must not be allowed to fasten itself upon them. It is very desirable that the sanitary authorities should be informed day by day of the precise number of patients in each hospital; of the number suffering from each disease; of the number of cases of contagious diseases, and of the mortality.

With this end in view, the State Board of Health will request each morning a report from the surgeon in charge, made after the morning round.

Each hospital should have an officer of the day, whose duty it should be to make a thorough examination of the sanitary condition and needs of the institution, and report each evening to the surgeon in charge. This report should be appended to the surgeon's morning report. Blanks will be furnished for these reports as soon as possible, which will enable them to be made out with very little trouble.

The board feels confident that it will be supported by the officers of all these admirable agencies for the relief of suffering in its effort to render them as effective as possible; and it will be the aim of the board on its part to do all in its power to supply them with whatever may be necessary for their complete outfit and comfortable maintenance. A complete list of the medical officers, nurses, and subordinates should be at once handed in to the secretary, and notice given of any changes which may occur in the personnel of the staff and service.

By order of the board.

(Signed) BENJAMIN LEE, M. D.,
Secretary.
GEO. G. GROFF, M. D.,
Member of Board.

(m.) *Permit to transport body.*

State Board of Health.

Date, ...

Name of Deceased,

. . . . . .

Name of Party Accompanying Deceased,

. . . . . .

Cause of Death,

DROWNING.

State Board of Health of Pennsylvania.

Permit to Transport a Dead Body.

JOHNSTOWN, PA., ... 1889.

Permission is hereby given to . . . . . to remove the body of . . . . . from . . . . . to . . . . . .

Cause of death—drowning.

I hereby certify that the deceased did not die of any contagious disease.

. . . . . .

Secretary of the State Board of Health.

NOTE.—This duplicate should accompany the body to its final destination.

(n.) *Canvasser's Report.*

Sanitary Survey of . . . . . .

No. 18

Owner (or tenant) . . . . . .

Street . . . . . Number . . . . . .

Number of Rooms . . . . . Number of Families . . . . . .

Adult Males . . . . . Adult Females . . . . . Children under 5 years . . . . .

Cellar . . . . . .

Kitchen . . . . . .

Living Rooms . . . . . .

Water Supply, { Source . . . . . Condition . . . . . Amount . . . . . .

Drainage . . . . . .

Privy (or water closet) . . . . . .

. . . . . .

Yard . . . . . .

Stable . . . . . .

Surroundings . . . . . .

. . . . . .

Present sickness in house . . . . . .

Has there been any typhoid fever, diphtheria, or scarlet fever in the house within 6 months? . . . . . .

Deaths within a year, ... Causes . . . . . .

What needs attention here? . . . . . .

Remarks: . . . . . .

. . . . . .

. . . . . .

[Signed] . . . . . Inspector.

Note.

The purpose of these blanks is to secure an *accurate* knowledge of the sanitary condition of the district surveyed. To this end, the Inspector should fill all the blanks *with care*, and as fully as possible. It is desirable that the records be made in ink. The following list of terms may aid in filling the blanks. By the erasure of one word, *always* indicate whether the occupant of a house [illegible]er or a tenant.

CELLAR: Clean, filthy, mouldy, damp, very damp, wet, foul, dark.
KITCHEN: Large, small, clean, filthy.
LIVING ROOMS: Ample, small, light, dark, clean, filthy.
SOURCE OF WATER: Well, spring, cistern, run, hydrant.
CONDITION OF WATER: Good, bad, suspicious.
AMOUNT OF WATER: Abundant, sufficient, insufficient.
DRAINAGE: Surface, sewer, good, bad.
PRIVY: Foul, overflowing, dangerous. (State distance from well.)
YARD: Clean, dirty, too shady, damp.
STABLE: Clean, filthy, offensive.
SURROUNDINGS: Note any unsanitary conditions in neighboring lots, streets, alleys or houses.

PRESENT SICKNESS: Make diligent enquiry concerning *all present* and *recent sickness* in the house: also, of all deaths, and the causes. Note what *most imperatively* needs attention at the house, and under REMARKS record any matters which could not be entered under any other head on the blank.

A sanitary survey made with care is of great value.

GEO. G. GROFF, M. D.

(o.) *Badge.*

STATE BOARD OF HEALTH

SANITARY CORPS.

(p,) *Meal Ticket.*

State Board of Health.

GOOD FOR ONE MEAL.

G. G. GROFF.

(g.) *Daily Report of Hospitals and Camps.*

STATE BOARD OF HEALTH OF PENNSYLVANIA —JOHNSTOWN.

Daily Report of Diseases and Sanitary Condition of . . . . . Hospital. Camp. District. . . . . 1889.

[NOTE.—Erase the two words not needed.]

Disease or injury.	Number of Cases. Hospital. New.	Hospital. Discharged.	Hospital. Remaining.	Hospital. Died.	Out-door and dispensary. New.	Out-door and dispensary. Discharged.	Out-door and dispensary. Remaining.	Out-door and dispensary. Died.	Condition of sinks.	Remarks on general sanitary condition.
Typhoid fever.										
Malarial fever.										
Scarlet fever.										
Diphtheria.										
Measles.										
Erysipelas.										
Constipation.										
Diarrhœa.										
Dysentery										
Dyspepsia.										
Pneumonia.										
Bronchitis.										
Tonsilitis.										
Croup.										
Nervous prostration. . .										
Rheumatism.										
Injury.										
Total.										

. . . . . .
Surgeon or Inspector.

[ENDORSEMENT ON BACK.]

Form 100.—Emergency.

DAILY REPORT

of

DISEASES AND SANITARY CONDITION

of

. . . . . Hospital,
. . . . . Camp,
. . . . . District,
JOHNSTOWN.

Respectfully forwarded to Benjamin Lee, M. D., Secretary State Board of Health.

. . . . . .
Surgeon.
. . . . . .
Medical Inspector.

(r.) *Pass.*

STATE BOARD OF HEALTH.

Pass . . . . . .

MEMBER OF SANITARY POLICE.

GEO. G. GROFF,

Executive Member in Charge.

(s.) *Request for Transportation.*

JOHNSTOWN, PA., *June* . . . . . , *1889.*

D. H. HASTINGS, *Adjutant-General.*

SIR: Please give bearer, Mr. . . . . . transportation to . . . . . .

He has been working for the State Board of Health.

. . . . . .

Executive Officer.

(t.) *Cellar Report.*

JOHNSTOWN, PA., ...

To . . . . . .

DEAR SIR: We have carefully examined the cellar of Mr. . . . . residence on . . . . . street, and find it in sanitary need of cleaning.

. . . . . .

Secretary State Board of Health.

(u.) *Voucher.*

STATE BOARD OF HEALTH.

SANITARY CORPS.

JOHNSTOWN, PA., *June* . . . . . *1889.*

I hereby certify that . . . . . has done . . . . . days' work at $ . . . . . per day as a . . . . . in the Sanitary Corps, from . . . . . to . . . . . .

. . . . . .

Chief Deputy Inspector.

(v.) *Time Card.*

Time report, ... , *1889. Nos.* . . . . . *to* . . . . .

Timekeeper, ... for . . . . . .

No.		Number of hours.	Rate per hour.	Amount	
. . .	General Foreman, . . .	. . . . .	. . . . .	. . . . .	. . . . .
. . .	Foreman, ...	. . . . .	. . . . .	. . . . .	. . . . .
. . .	Timekeepers, ...	. . . . .	. . . . .	. . . . .	. . . . .
. . .	Skilled laborers, ...	. . . . .	. . . . .	. . . . .	. . . . .
. . .	Laborers, ...	. . . . .	. . . . .	. . . .	. . . . .
. . .	Water boys, ...	. . . . .	. . . . .	. . . . .	. . . . .
. . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
. . .	Heavy wagons. . . .	. . . . .	. . . . .	. . . .	. . . . .
. . .	Wagons, ...	. . . . .	. . . . .	. . . . .	. . . . .
. . .	Carts, ...	. . . . .	. . . . .	. . . . .	. . . .
. . .	Extra horses, ...	. . . . .	. . . . .	. . . . .	. . . . .

(w.) *Pay Roll.*

Form No. 5,

Pay Roll of Clerks, Skilled Workmen, Laborers, Teams, Etc., in the employ of the State Board of Health at Johnstown, Pa., for the . . . . . days ending . . . . . 1889.

Names or numbers.	Hours.	Rate.	Total.	Deductions.	Amount paid.	In presence of	Names or number.	Hours.	Rate.	Total.	Deductions.	Amount paid.	In presence of
Totals.							Totals.						

(Endorsements on back of pay roll).

Voucher No. . . .

Pay roll of clerks, skilled workmen, laborers, teams, etc., in the employ of the

STATE BOARD OF HEALTH,

At Johnstown, Pa., for the . . . day ending . . . . . 1889.

STATE ACCOUNT.

Amount, $ . . . . . .

JOHNSTOWN, PA. 1889.

Personally before the undersigned authority came . . . . . who, being duly sworn according to law, deposes and says that he kept the time of the men whose names appear on the face of this roll, and of the teams, and that the same was accurately kept, and this roll is a correct ranscript from the original books in which the time was kept.

. . . . . .

Sworn and subscribed before me this . . day of . . . . . 1889.

. . . . . .

Lieut. Col., A. D. C.

Office of the State Board of Health.

JOHNSTOWN, PA., 1889.

I hereby certify that the within roll is correct and in accordance with my instructions as to prices to be paid that the work was performed, and the amount claimed is due and payable.

. . . . . .

President.

. . . . . .

Secretary.

ACCOUNTING DEPARTMENT.

JOHNSTOWN, PA., . . . 1889.

The within roll . . . . . .

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Lieut. Col., A. D. C.

37.—DISINTERMENT OF THE UNIDENTIFIED DEAD.

(a.) *Letter of Instruction to the Committee.*

PHILADELPHIA, *October 4th*, 1889.

Messrs. J. B. Kremer, Chairman, Herman Baumer, James McMillen, James M. Shumaker and John Henderson, Committee on removing and burying the unidentified dead.

GENTLEMEN:—Your communication in reference to the proposed action of the Relief Commission in the exhumation and burial of the unidentified dead, who have been interred at different points since the flood of May 31st, and requesting instructions as to the manner in which is sad and important duty to the unknown dead should be performed in order that it may not prove a source of danger to the living, is received.

In response, I beg leave to call your attention to the enclosed regulation of the State Board of Health upon this subject. You will observe that such disinterments in populous places, are forbidden between April 1st and October 15th. The unusual emergencies of the past summer have, however, appeared to the board to justify it in authorizing the occasional removal of single bodies. But it feels that the unearthing of so large a number at once, many of them in an advanced stage of decomposition, is a much more serious matter, and calls for the exercise of unusual care to prevent resultant sickness. It therefore enjoins upon your committee to exercise the following:

PRECAUTIONS.

1. It is desirable that the disinterment shall not take place before the fifteenth day of October, but if before that date, each body must be enclosed in an air tight box or casket.

2. There shall be no funeral procession or other public demonstration calculated to attract a crowd during the process of disinterment and transportation.

3. There shall be no religious services until after the completion of the burial of all bodies which have been disinterred.

4. In the act of transportation, the built-up portion of the town shall be avoided as much as possible.

5. Whenever it is considered expedient to remove a body from the coffin or box in which it was originally buried, the said body shall be immediately wrapped in a sheet, soaked in a solution of bi-chloride of mercury of the strength of two drachms to the gallon of water, and the box or coffin whence it was removed shall be at once burned. Saw dust, wet with carbolic acid solution of the strength of one ounce to the gallon, bromo-chloralum, Bullen's disinfectant, hypochlorite of soda, or Platt's chlorides, shall be placed in the coffin into which the body is

to be removed; the body shall be covered with the same, and the lid immediately screwed down.

6. Quick-lime shall be freely strewn in the excavation from which the body has been removed, and also over the top of the returned earth.

7. In the absence of a local board of health, the State Board of Health will furnish a transit permit for each body which is necessarily transported over a railroad, without which it must not be received by the agents of the road.

I have the honor to be, Gentlemen,

Yours very respectfully,

BENJ. LEE,

Secretary and Executive Officer, State Board of Health.

(b.) *Report of the Committee.*

HARRISBURG, PA., *January 3d*, 1890.

Benjamin Lee, M. D., Philadelphia, Pa.

DEAR SIR:—Your letter to Dr. Matthews, Medical Inspector at Johnstown, asking for a report of the work done by the Committee on Reinterment, has been referred to me.

The means adopted to prevent any evil effects from the exposure of decomposed bodies, were a free use of disinfectants on the soil around the spot where the bodies were transferred from the old coffins to the new ones, and the immediate burning of the old coffins on a pitch or rosin fire.

The total number of bodies raised by the committee was 844. Of this number 447 were females, 350 males, and 47 sex unknown. Forty-four bodies were identified as a result of disinterment while the work was in progress, and at least twelve more have since been identified by articles taken from the person when raised. No estimate of the age can be arrived at yet, the work has not progressed that far.

Very truly yours,

JAMES MURTHA.

(c.) *List of Permits granted for the Disinterment and Transportation of the Bodies of Persons Drowned at Johnstown.*

Name.	Sex.	Age.	Whence removed.	Place of final interment.
Henry Clay Adams.	Male.			
Frances Earle Strophel.	Female.			
Mrs. H. W. Smith.	Female.			
Nelly Clark.	Female.		Prospect Cemetery.	
Mrs. Swineford.	Female.		Grandview Cemetery.	Union Cemetery.
Florence Allison.	Female.		Prospect Hill.	Grand View.
Caroline Muyer.	Female.		Prospect Hill.	Grand View.
John A. Muyer.	Male.		Prospect Hill.	Grand View.
Mrs. Hamilton.	Female.		Grand View.	
Melda Moore.	Female.			
Mrs. Bracker.	Female.		Prospect Hill.	Lower Yoder Cemetery.
Mrs. Mary Oyler.	Female.		Peelorville.	
Mrs. Mary Drew.	Female.		Peelorville.	Grand View.
			Nineveh.	Johnstown.
Elsie Mary Davis.	Female.	Three.		Johnstown.
Mrs. E. W. Jones.	Female.	Forty-five.	Johnstown.	Kalamazoo, Michigan
Mrs. J. Ranney.	Female.	Sixty-five.	Johnstown.	Curwensville.
—— Lowry.	Female.	Twenty-five.	Nineveh.	Johnstown.
Miss Dougherty.	Female.	Sixteen.	Prospect Hill.	
E. Vincent Webber.	Male.	Thirty.	Leechburg.	
Iva Hill.	Female.	Six.	Wilmore.	
James Mullen.	Male.	Twenty-two.	Allensburg.	
Mrs. J. C. Tucker.	Female.	Forty-five.	Allensburg.	
Lillian Tucker.	Female.	Twenty.	Newark, N. J.	
C. H. Meisel.	Male.	Thirty.	Armagh.	
John W. Trimelle.	Male.	Forty.	Pittsburgh.	
Mrs. David Creed.	Female.	Forty-five.	Pittsburgh.	
David Creed.	Male.	Fifty.	Nineveh.	Johnstown.
Thomas Clark.	Male.		Nineveh.	
Mrs. Gussie Swineford.	Female.	Twenty-three.	St. Louis, Mo.	
Mrs. John Ryan.	Female.		Grand View.	Catholic Cemetery.
Thomas Matthews.	Male.		Catholic Cemetery.	Lower Yoder.
William Jones	Male.		Prospect Hill.	Grand View.

39.—THE WORK OF THE STATE BOARD OF HEALTH AT JOHNSTOWN, AFTER THE MEETING OF SEPTEMBER 27, 1889.

A special meeting of the board was held at Johnstown September 27th. At this meeting reports were read from the inspectors, detailing the work accomplished since the last meeting, and a statement of the then existing condition was made by the secretary, who felt justified in asking the board to declare that the conditions which led to the declaration of nuisance in Johnstown and the Conemaugh valley, had been so far removed that it would be safe for the state to cease its sanitary operations after the thirtieth day of September. A careful inspection of the district was made, and a resolution in accordance with the above statement was adopted.

This action, as was anticipated, called forth strong remonstrance from the citizens, a committee of whom visited Governor Beaver and laid before him their reasons for desiring that certain obstructions to the mouths of the sewers and the free flow of the drainage should be removed before the state left the field.

A conference was held at Harrisburg, between His Excellency, the committee and the Secretary, the outcome of which was, that while the general plan of operation should not be resumed, a sufficient force should be placed upon the Stony Creek river, to restore the channel at such points as it was necessary to carry off the drainage, and prevent

the accumulation of filth in stagnant pools along the shores. The secretary returned immediately to Johnstown and inaugurated the work, which was accomplished to the satisfaction of the citizens, and on the tenth day of October, he addressed the following communication to the governor, announcing officially, the abatement of the nuisance:

40.—COMMUNICATION TO HIS EXCELLENCY GOVERNOR BEAVER, DECLARING THE NUISANCE ABATED.

JOHNSTOWN, *October* 10, 1889.

To His Excellency James A. Beaver, Governor of the Commonwealth of Pennsylvania.

SIR:—On the seventh day of June, 1889, I had the honor to address your Excellency a communication, in which I reported an inspection of Johnstown and the neighboring boroughs and the Conemaugh and Kiskiminetas valleys, which had been visited by a devastating flood. Based upon this inspection, I, at the same time, made official declaration, in the name of the State Board of Health, of the existence of a nuisance prejudicial to the public health in these valleys, and called upon your Excellency, in view of the extent of this nuisance and of the entire inability of the local authorities to cope with the emergency, to "at once employ such force as might be necessary to remove and abate the same."

I have now the honor to report that this work has been brought to a successful termination.

In response to the above noted declaration and request, a large force of laborers was immediately placed at my disposal, under the command of Adjutant General D. H. Hastings, with Col. H. T. Douglass, as Chief Engineer. At a subsequent period, General Hasting's official duties called him elsewhere, the force was considerably reduced, and Captain Geo. C. Hamilton assumed control of operations. I desire here to acknowledge the untiring zeal and energy displayed by these officers in the discharge of their arduous and responsible duties, the uniform courtesy with which my instructions were received, and the fidelity with which they were carried out. The work which has been accomplished may be briefly summed up as follows:

The rivers have been scrupulously patrolled from the state line on the Ohio, to South Fork on the Conemaugh, a distance of not less than 120 miles, with the result of recovering hundreds of bodies, and destroying large numbers of carcasses. The immense masses of wreckage under which Johnstown was buried have been entirely removed, and numerous dead bodies of human beings and animals thus extricated, disinfectants having been freely used to prevent these from becoming a source of disease while still out of reach of the laborers.

Many miles of streets have been excavated, and tens of thousands of tons of earth carted away from private properties and cellars in order to

remove the filth with which it was saturated. An idea of the extent of this labor may be gained when it is stated that an area of several acres on which this earth was dumped has been raised fifteen feet above the previous level. Disinfectants were also lavishly used during the prosecution of this difficult and dangerous work. In fact, but for the constant and unsparing application of these agents, the only recourse would have been a general conflagration. Hundreds of wrecked buildings which harbored filth or were dangerously insecure have been torn down and destroyed. The vast and densely packed drift at the stone bridge has been rent asunder by dynamite, and dragged out with the result of removing much putrescent matter which was polluting the stream. Substantial bridges have been built to afford an opportunity for the transportation of filth and wreckage. The mouths of all the sewers have been opened, and the channels of the rivers freed from impediments to the ready escape of the sewage. The heated term which was so much dreaded has passed with but little serious illness, and the advent of frost brings increased security.

Whatever of imperative sanitary work remains to be done is now quite within the means of the residents, who, encouraged by the generous aid and sympathy which have been extended to them from all parts of the civilized world, are now resuming the responsibilities of citizenship.

I therefore, in the name of the State Board of Health, declare the nuisance in this district removed and abated, and request that the state forces be withdrawn from and after Saturday, the twelfth day of October.

I have the honor to be,

Your Excellency's most obedient servant,

(Signed) BENJAMIN LEE,

Secretary and Executive Officer, State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania

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I.—PITTSBURGH AND OPERATIONS ON THE RIVERS.

1. Report of the Medical Inspector of the Allegheny District.
2. Cautionary Proclamation.

1.—REPORT OF DR. JAMES R. THOMPSON, MEDICAL INSPECTOR OF THE ALLEGHENY DISTRICT.

PITTSBURG, *June 28th*, 1889.

Dr. Benjamin Lee, Secretary State Board of Health.

DEAR SIR:—While the 3d Annual Sanitary Convention of the State Board of Health was in session in this city, at which you were present, a dreadful calamity came upon the people of Johnstown, in the form

of a deluge, caused by the bursting of the South Fork Dam. This deluge occurred about five o'clock Friday evening, May 31st, 1889, and owing to the cutting off of communications the reports which reached Pittsburg the succeeding twenty four hours were meager and unsatisfactory. By the time we had reached the closing session of our convention (Saturday evening June 1st, 1889) reports from Johnstown had become reliable. You, dear Secretary and Dr. Groff of our board, started at once for the scene of the disaster, arriving there among the first from our city to lend your aid in alleviating the sufferings of those injured and despairing people, and to look after the sanitary condition of the town. After attending to the more immediate necessities of the emergency, and leaving Dr. Groff in charge of affairs in Johnstown, you returned to Pittsburgh on the evening of June 6th, from which point you wired contractor William Flinn, at Johnstown, as follows:

"I disapprove Mr. Patton's plan of throwing debris into the creek. It will only make the jam worse. It should all be burned. This helps to keep the air pure."

(Signed) BENJAMIN LEE,
Secretary State Board of Health.

On the morning of June 7th, 1889, you established the temporary executive office of the State Board of Health at the Chamber of Commerce, this city, pressing the writer into service as your assistant, and at once sent an order on Sheriff Alex. Æ. McCandless of Allegheny county, requesting him to proceed without unnecessary delay in the proper equipment of two tugboats; one boat to patrol the right bank, the other the left bank of the Allegheny river as far up as Freeport, at the confluence of the Allegheny and Kiskiminitas Rivers, with instructions to search for dead bodies of human beings and animals, the former to be delivered at nearest rail road station for identification and burial, and the latter to be burned; all drift piles that could not be pulled apart were be burned.

The gang known afterwards as the "Parker Gang" was next organized, but did not get away until the next morning, Saturday, June 8th, 1889, on 8:45 A. M. train, owing to difficulty in securing some one as superintendent over the gang. Later in the day J. W. Parker was appointed Superintendent, with Dan. F. O'Conner and William Sprague as bosses. Each of the three mentioned men were furnished with separate typewritten documents, as their authority in the prosecution of their work. The document of O'Conner and Sprague each being worded the same, read as follows:

PITTSBURGH, *June 7th*, 1889.

William Sprague, (Dan. F. O'Conner)—Is hereby authorized to take a gang of ten (10) wreckers, to patrol the right bank of the Kiskimin-

itas and Conemaugh rivers, up to such point as he shall meet a corresponding gang coming down from Johnstown. His orders are to carefully examine the banks, river bottoms and islands—if human bodies are found, to deposit them at the nearest rail road station—if dead animals are found, to cover the same with wood and wreckage and burn them to ashes. If dead animals have been buried to dig them up and burn them, and to burn all drift heaps, the burning of which would not endanger human habitations. In this work he will co-operate with the county officials wherever he finds them engaged.

All relief committees in charge of provisions are requested to furnish him rations for his men, as they are engaged on important relief work.

By order of the State Board of Health.

(Signed) BENJAMIN LEE,
Secretary and Executive Officer.

The document furnished Mr. Parker, superintendent of these gangs read as follows:

PITTSBURGH, *June 8th*, 1889.

J. W. Parker is hereby authorized to take a gang of twenty-two (22) wreckers to patrol the banks of the Kiskiminitas and Conemaugh rivers up to such point as he shall meet a corresponding gang coming down from Johnstown. His orders are to carefully examine the banks, river bottoms and islands—if human bodies are found to deposit them at the nearest rail road station—if dead animals are found to cover the same with wood and wreckage and burn them to ashes. If dead animals have been buried to dig them up and burn them, and to burn all drift heaps, the burning of which will not endanger human habitations. In this work he will co-operate with the county officials wherever he finds them so engaged.

All relief committees in charge of provisions are requested to furnish him rations for his men, as they are engaged on important relief work.

Mr. Parker's authority over both gangs is absolute and he will be respected accordingly.

By order of the State Board of Health

(Signed) BENJAMIN LEE,
Secretary and Executive Officer."

Captain William Rodgers received orders as follows:

PITTSBURGH, *June 8th*, 1889.

Captain William B. Rodgers of Pittsburgh is hereby authorized to organize a corps of wreckers consisting of five men, in addition to his ordinary crew, to patrol the Ohio river down to the State line, head of Line island, carefully examining both banks and all islands with instructions to search for dead bodies of human beings and animals.

He is authorized to employ Dr. James Dickson to disinfect dead

bodies and decide whether they shall be preserved for identification or buried, and graves marked with description.

All dead animals are to be burned. All drift piles that cannot be pulled apart are to be burned. No wreckage is to be allowed to pass down the river.

In this work Captain Rodgers will co-operate with the county officials who will render him all the assistance in their power.

(Signed) BENJAMIN LEE,
Secretary State Board of Health."

By noon of June 8th, you had every reason to feel satisfied with what you had accomplished in so short a time. The temporary Executive office was already in good working order, and many things had received your attention, the detailing of which here would make my report far to lengthy. Deciding at this juncture to return to Johnstown, you placed the writer in charge of the temporary office, accompanying the act with the following written authority:

CHAMBER OF COMMERCE, PITTSBURGH, PA., *June 8th*, 1889.

Dr. J. R. Thompson, Medical Inspector of the "Allegheny District" is hereby placed in charge of the temporary Executive Office of the board at this place, with authority to act and will be respected accordingly.

(Signed) BENJAMIN LEE,
Secretary and Executive Officer.

In company with Dr. Probst, Secretary State Board of Health of Ohio, you left Pittsburgh at 1 P. M. via B. & O. R. R. for Johnstown.

From this time on, the writer did not see you (expecting the two hours in Pittsburgh on the night of June 12th, 1889, when on your way to Harrisburg via A. V. R. R. to consult with Gov. Beaver) until July 16th, 1889, when he turned over to you at Johnstown the settled and unsettled accounts of the business transacted at the Pittsburgh office.

In the interim (from June 8th, until July 16th, 1889, with the above exception) communication between us was by letter or telegram.

Immediately after your departure I received the following report dated. PITTSBURG, *June 8th*, 1889.

Dr. Benjamin Lee, Secretary State Board of Health.

DEAR DOCTOR:—In pursuance of your order of June 7th, 1889, I secured the Steamers "I. N. Hook" and "Rescue" and have patroled the right and left banks of the Allegheny River as far up as you requested—carrying out your instructions whenever and wherever it was possible.

Respectfully,

(Signed) ALEX. Æ. MCCANDLESS,
Sheriff Allegheny County.

Sunday, June 9th, came your order by telegraph, signed "Groff" for disinfectants, the size of which was probably never equalled in any single order of disinfectants especially for sanitary purposes.

The order is as follows:

"JOHNSTOWN, PA., *June 9th*, 1889.

Ship us immediately 50 barrels Bullen's disinfectant; 100 barrels carbolic acid; 100 cases bromine; 2500 lbs. chloride of lime."

The day being Sunday and the order not reaching me until the afternoon, made it difficult to get the manufacturing establishments opened up and their men to handle the goods. Besides, I soon discovered that such a quantity of disinfectants was not to be found in stock in the city, and it would probably be several days before the order could be filled, consequently I took what I could get, 24 barrels Bullen's disinfectant and 2600 lbs. of chloride of lime were shipped in Baltimore and Ohio, car No. 12816, Sunday night, at 2 A. M. attached to the bread train. 74 barrels of crude carbolic acid were also loaded same night in Baltimore and Ohio car No. 10266, but not in time to go with bread train at 2 A. M., and it lay over at the Baltimore and Ohio depot until the 5 P. M. train Monday, June 10, 1889. The other 26 barrels crude carbolic acid were not shipped until last of week.

MONDAY, *June 10th*, 1889.

The National Bromine Company shipped to-day, 5 P. M., Baltimore and Ohio Railroad car No. 10230, 100 cases bromine, sending four men to handle it free of charge. You will observe we have going by this 5 P. M. train to-day, the 74 barrels crude carbolic acid which was loaded Sunday night. These goods should have reached Johnstown, Tuesday morning, June 11th, 1889, and I doubt not they did, but they were not found promptly, partly owing to the fact that the railroad company not charging freight on goods to Johnstown, refused to give a bill of lading (which would make them liable in case of loss) and partly owing to shippers (under the circumstances) neglecting to placard the cars "State Board of Health." My orders to shippers in every case were to placard the cars.

THURSDAY, *June*, 13, 1889.

In addition to the regular business, I received an order by telegraph from Johnstown, signed "G. G. Groff," for "200 large sized sprinkling cans such as gardeners use." The order was filled by J. B. Scott & Co., and shipped via Baltimore and Ohio Railroad. The writer personally superintended the loading of the sprinklers and placarded the car (No. 35,117) "State Board of Health, Johnstown, Pa." These sprinklers were to be used in sprinkling disinfecting solutions upon any débris where an odor could be detected.

FRIDAY, *June 14th*, 1889.

To-day received Captain Wm. B. Rodgers' report of what was done by him and crew in their trip down the Ohio river to the state line. The report is as follows:

PITTSBURG, PA., *June 14th*, 1889.

Dr. Benjamin Lee, Secretary.

DEAR DOCTOR:— Your order of June 8th received. In compliance with same a report is herewith submitted of the work accomplished by the steamer "Tide."

Start was made from Pittsburg wharf on Saturday, June 8th 1889. at 3.30 P. M. Crew consisted of nineteen, which included the extra force of five men, for which your instructions called.

It affords me pleasure to notify you that a most careful search for dead bodies, and all carcasses of dead animals has been made to the State line. On Saturday, June 8th 1889, at 3.30 P. M., the search commenced.

At Brunot's island only dead animals were found, which were burned as per instruction of your order. The report was circulated there that sixteen dead bodies (human) had been found, but after a careful investigation, the report was found to be false.

At McKee's Rocks a report was circulated that six bodies (human) had been found, which proved also to be without foundation. From either shore wreckers were worked; all the drift piles, willows, and anything that looked like rubbish were carefully examined, and where carcasses of dead animals were discovered, they were either burned on the spot, or hauled to a place where no danger to the property of the residents along the shores could be caused.

Seven Mile island was reached Saturday evening. On Sunday, Laurie bar, Merriman's riffle, the Trap at Haysville, Deadman's island, Big Sewickley and down to Economy, each shore and the entire river were carefully searched. Landing was made for the night at Economy. The following morning this search was continued, and the work was pushed as far as Rochester, taking in the shores on either side; taking in Logstown riffle, Baden, Hog island, Crow island, Crow run and Freedom.

At Vanport the body of a child over three years old was found by Charles Moore, of Conway. The only marks to identify the same, were chicken pox mark under right nostril and one on bridge of nose; scar on left cheek bone, on left hand one about the size of a dime; left wrist healed cut one half inch long; brown hair, brown eyes; no mark on clothing, which only consisted of gauze undershirt and linen slip over same. This body was taken to Beaver by the undertaker and buried there. Search continued past Vanport when the boat returned to Rochester. Sheriff Welsh of Beaver county, was called upon and furnished an additional force of eight men to help on with the work to Line is-

land. Raccoon creek, Montgomery island and Industry followed. Nothing but carcasses of dead animals were found and burned.

Phillasey island was reached June 12th. Body of man was found far advanced in decomposition, and after being properly cared for by Dr. James Dickson, was buried about 200 yards from the point of the island, on the highest ground to be found. Tombstone with best possible description of the remains was erected at the grave. The body was so far advanced in decomposition, that it is impossible to give any accurate description. No papers or marks of any kind could be found by which he could be identified. He was probably 40 years old; height 5 feet; remnant of hair left looked sandy; was likely a laboring man.

Nothing but carcasses of animals was found from this point to the State line, where all were burned. Sign was placed on State line island, at point where search was finished.

Careful inspection was made on the return trip. Hugh Nulton, living opposite Beaver station, caught on Thursday, body of woman floating in the river. Age about 25 years; hair black; well dressed, with gingham apron. Was taken to Beaver for burial by the undertaker of that place, and all marks for identity are preserved.

I am under obligations to Dr. James Dickson and Dr. J. N. Walters, who were both commissioned to make this trip with me, and who have worked faithfully and hard in the search for bodies carried down to this point from Johnstown.

I am safe in saying that the river shores to Line island are more free from dead bodies of all kinds than has been the case for many years past. The citizens all along the river have applauded your proceedings in this undertaking, and have expressed gratitude for the prompt measures you have taken to prevent an epidemic. I also wish to compliment Sheriff Welsh, of Beaver county, for the efficient aid he has given, not only by personal search, but in giving into my command eight men ready and willing to do the work required. To make the investigation as carefully as I know you would require it, has taken until this (Friday) evening, June 14th, 1889.

Very respectfully yours,

(Signed) WM. B. RODGERS.

P. S.—At Point Remington, the body of a boy about 16 years of age was caught by Hugh Craig, on Wednesday at 11 o'clock. His name is presumed to be Jenkins. He was dressed in dark striped pants and woolen shirt, but had on no coat. He had on his feet brogan shoes, which makes it almost certain he was a mill hand. Coroner Watson of Beaver county, held an inquest, and the remains were laid to rest on the right hand shore of the Ohio at Remington. A sign was made by Mr. Evans, engineer of the boat, and on it was painted the name and date of burial. The body was decently interred in a rough box made from boards taken from a drift pile in the near vicinity.

The undertaking has been one of hard and faithful labor, which I feel confident you will appreciate.

Yours respectfully,
(Signed) WM. B. RODGERS.

MONDAY, *June 17th*, 1889

The Parker gangs of wreckers reported to me to-day. A letter from you, handed me by Mr. Parker, informed me that their wages would continue until the next night (June 18th, 1889).

I was a little short of funds when they reported, but after some little delay managed to pay them in full. The sum paid them, after deducting a few small bills they had contracted in name of State Board of Health, amounted to $839.41.

THURSDAY, *June 20th*, 1889.

The following order for provisions, signed "Benj. Lee," was shipped via Pennsylvania Railroad to Johnstown to-day.

Six cases tomatoes, 6 cases corn, 200 lbs. granulated sugar, 5 bushels beans, 20 lbs. dried corn, 250 lbs. shoulders, 150 lbs. butter, 1 case condensed milk, 8 lbs. coffee, 2 barrels water crackers, in one order, and every third day, 6 crates of bread.

By your order, I discontinued shipment of bread after second consignment.

SATURDAY, *June 22d*, 1889.

Sent by express, your order for 60 lbs. ground coffee.

WEDNESDAY, *June 26th*, 1889.

Sent to your order, 500 lbs. shoulders by freight to Johnstown.

In completing this report, let us acknowledge our obligations to the following corporations, individuals and business firms, for favors received during the Johnstown calamity:

We sincerely thank the Chamber of Commerce of Pittsburg, Pa. J. O. Brown, Esq., Chief of Bureau of Public Safety, Pittsburg, Pa. James Bradley, Esq., Superintendent Board of Health, Allegheny city, Pa. James W. Clark, Esq., Superintendent Western Union Telegraph Company, Pittsburg, Pa. Pennsylvania Central Railroad Company, Baltimore and Ohio Railroad Company, Murdoch, Kerr and Company, Pittsburg, Pa., and Geo. A. Brooks, Private Telegraph Operator at Chamber of Commerce.

Respectfully submitted,
JOS. R. THOMPSON,
Medical Inspector, Allegheny District.

2.—CAUTIONARY PROCLAMATION.

On the afternoon of June 4th, the following Cautionary Proclamation appeared in the Pittsburg papers:

The State Board of Health has satisfied itself by personal inspection that the waters of the Conemaugh, Allegheny and Ohio rivers must become contaminated as a result of the recent disastrous flood at Johnstown. It thereupon urges all persons who are compelled to depend upon those streams for their water supply, to use no water for household purposes which has not been boiled.

II.—THE VALLEYS OF THE WEST BRANCH OF THE SUSQUEHANNA AND OTHER REGIONS DEVASTATED BY THE FLOOD.

1. Communication to His Excellency Governor Beaver, declaring the existence of a Nuisance prejudicial to Public Health in the Valleys of the West Branch of the Susquehanna and other flooded regions.
2. Report of Medical Inspector Wm. Leiser, M. D., of an Inspection of the West Branch of the Susquehanna and its Tributaries.
3. Report of Medical Inspector P. A. Hartman, M. D., of an Inspection of the Susquehanna and Juniata Rivers.
4. Report of Prof. Geo. G. Groff, of an Inspection of the Flooded District of the State east of the Alleghenies.
5. Action of the Burgess and Health Officer of Jersey Shore.
6. Reports of Medical Inspector E. D. Payne, M. D. and T. B. Johnson, M. D., of an Inspection of the West Branch of the Susquehanna and its Tributaries.
7. Final Reports of the Committee on the Flooded Regions west of the Alleghenies.
8. Shipments of Disinfectants from Johnstown to other Flooded Regions.
9. Circular of Information distributed in every Borough and Village of the Flooded District.
10. Communication to His Excellency Governor Beaver, declaring the Nuisance in the Flooded Regions west of the Alleghenies abated.

1.—COMMUNICATION TO HIS EXCELLENCY GOVERNOR BEAVER, DECLARING THE EXISTENCE OF A NUISANCE PREJUDICIAL TO PUBLIC HEALTH IN THE VALLEYS OF THE WEST BRANCH OF THE SUSQUEHANNA, AND OTHER FLOODED REGIONS.

HARRISBURG, *June* 14, 1889.

To His Excellency James A. Beaver, Governor of the Commonwealth of Pennsylvania, Harrisburg, Penna.

SIR:—Connection between Johnstown and other parts of the state having been cut off to such an extent that it was impossible for me to obtain definite information as to the condition of other flooded regions at that place; I visited Pittsburg June 6th, and there for the first time obtained knowledge of the portions of the state requiring attention on this ground. I immediately addressed the following telegram to the eight medical inspectors of the State Board of Health, whose names appear below:

"You are hereby empowered and instructed to make an inspection of the flooded regions in your district, with full authority to employ

laborers in the name of the state, to discover dead bodies of human beings and animals and to burn the latter with the débris."

To L. H. Taylor, M. D., Wilkesbarre, Medical Inspector of the Wyoming district.

To P. A. Hartman, M. D., Harrisburg, Medical Inspector of the Susquehanna district.

To William Leiser, Jr., M. D., Lewisburg, Medical Inspector of the Northumberland district.

To E. D. Payne, M. D., Towanda, Medical Inspector of the Lycoming district.

To R. L. Sibbet, M. D., Carlisle, Medical Inspector of the Cumberland district.

To A. B. Brumbaugh, M. D., Huntingdon, Medical Inspector of the Juniata district.

To C. B. Dudley, M. D., Altoona, Medical Inspector of the Central district.

To Spencer M. Free, M. D., Beechtree, Medical Inspector of the Western Slope district.

On the following day I organized two gangs of wreckers, each with a foreman, with one superintendent over both gangs, to proceed from the mouth of the Kiskiminetas to Johnstown, to recover all dead bodies and burn all carcasses with the débris and to report to me at Johnstown.

A force with similar instructions was sent down the Ohio, as far as the state line, on a steamboat.

The sheriff of Allegheny county had already despatched two boats up the river as far as Freeport, for the same purpose, the last boat leaving the day I arrived at Pittsburgh.

On Sunday, June 9, I sent the following telegram to the sheriffs of the counties mentioned below: "You are hereby instructed to cooperate with the medical inspectors of the State Board of Health, in reclaiming dead bodies and burning carcasses and débris in your county."

To the sheriffs of Dauphin, Northumberland, Union, Snyder, Lycoming, Tioga, Bradford, Cumberland, Juniata, Mifflin, Centre, Clearfield, Clinton, Blair and McKean counties.

Dr. C. B. Dudley of the Altoona district, reports as follows:

Being cut off from rail communication with Johnstown, I immediately began to turn my attention to the other portions of my district, and telegraphed to reliable parties on Clearfield creek, in the Juniata valley, in the Bald Eagle valley, in the Susquehanna valley, at Lock Haven and Renovo, to learn the conditions of affairs in those regions.

"In the course of the next day messages were received, which very greatly relieved the anxiety in regard to those regions. Mr. W. H. Brown, Chief Engineer of the Pennsylvania Railroad, who had per-

sonally been over the Juniata valley from Altoona as far east as my district extends, telegraphed me that the whole valley was in good condition, being completely scoured out, and as there had been no loss of life in this region, and very few animals destroyed, there seemed to be no danger to the public health.

"Mr. R. G. Ford, Superintendent of the Bell's Gap Railroad, which runs through the region flooded by Clearfield creek, telegraphed that there were no points along the line of that road to Punxsutawney, that needed attention in the matter of discovering dead bodies, and burning dead animals.

"Mr. S. S. Blair, Superintendent of the Bald Eagle Valley Railroad, who was personally over the ground, gave me very satisfactory information in regard to the region from Tyrone nearly to Lock Haven.

"On Sunday and Monday, the 9th and 10th of June, I personally inspected the South Fork region, as far west as Conemaugh viaduct, and found the condition of affairs not at all threatening to the public health. The whole Conemaugh valley from South Fork dam down, had been so completely cleaned out that there was nothing except débris from the cars, and an occasional animal that needed attention. These were receiving attention from the local authorities.

"On Tuesday, June 11th, I went personally to Lock Haven, and made an inspection of the place. This region, as well as Renovo, some 30 miles higher up the river, and the contiguous small towns in this portion of the Susquehanna valley, were peculiarly afflicted by the flood. Instead of the filth being carried away by the violence of the flood, as in the Conemaugh and Juniata valleys, the flood was sluggish and the consequence was the whole town of Lock Haven, and indeed all the towns in this region, were covered, after the water subsided, with a layer of mud, containing large amounts of decaying organic matter. In reality, the manure from the stables and the filth from the cesspools and water closets, were simply floated out of the places where they had been, and disseminated over the whole surface of the towns in many places, the cellars and first floors being covered more or less with this filth. In Lock Haven it was not at all uncommon in going through the streets, to meet an odor as of a night soil cart, simply arising from the stirring up and washing out of the filth from the water closets.

"In all the inspection which I made personally, I found an energetic feeling among the people to clean up and take care of the public health. The only real difficulty seemed to be lack of appliances, and money to pay for the cleaning up."

I have already forwarded to your Excellency the report of Health Officer Cline of Jersey Shore, Lycoming county. The reports of Dr. Paul A. Hartman, of the Susquehanna district, and of Dr. E. D. Payne, of the Lycoming district, the details of which I will furnish

your Excellency later, show a condition from a sanitary point of view, similar to that reported above as existing in Renovo, Lock Haven and other places, to exist in Williamsport and other flooded towns on the West branch of the Susquehanna, and on the Susquehanna below the junction with the East branch.

Reposing entire confidence in the reports of these experts I, therefore, by virtue of the authority conferred upon the State Board of Health by the Act of June 3d, 1885, and upon its Executive Officer by Regulation No. 1 of the Board, declare the condition existing in the towns and along the rivers, above rehearsed and described, to constitute a nuisance prejudicial to the public health, and inasmuch as the proportions of said nuisance are so extensive as to make it impossible for the local authorities to remove and abate it, I respectfully call upon your Excellency to at once employ such means as may be necessary to effectually remove and abate the same.

I have the honor to be,

Your Excellency's most obedient servant,

BENJAMIN LEE, M. D.,

Secretary and Executive Officer, State Board of Health of Pennsylvania.

2.—REPORT OF MEDICAL INSPECTOR WM. LEISER, JR., M. D., OF AN INSPECTION OF THE WEST BRANCH OF THE SUSQUEHANNA AND ITS TRIBUTARIES.

LEWISBURGH, PENNA., *July 18th*, 1889.

Benjamin Lee, M. D., Secretary State Board of Health, Philadelphia, Pa.

DEAR DOCTOR:—On the 7th June, 1889, I received the following telegraph from you: "You are hereby directed to investigate the condition of the flooded regions in your district, with full authority to employ men in the name of the state to discover the dead bodies of human beings, or of animals—burning the latter."

I immediately employed men to assist and to make thorough search for dead animals, following the streams in my district, and traversing the country flooded thereby.

The streams causing the most damage were: The West branch of the Susquehanna river, and Penn's, White Deer, Buffalo and Middle creeks.

I had the river followed from Montgomery station to Georgetown, a distance of about 50 miles; Penn's creek, in its course through Union and Snyder counties, a distance of about 50 miles; Middle creek, in its course through Snyder county, a distance of about 24 miles; White Deer creek and Buffalo creek, in parts of their courses through Union county, making a total distance of about 150 miles.

Notice was also given to the people living along the streams that for all dead animals found and burned, drowned by the flood, a reasonable compensation would be paid by the state.

The animals found and burned were as follows:

Cows,	23
Mules,	3
Hogs,	26
Dogs,	6
Total,	58 animals burned.

I found that the towns in the district had organized local boards of health for the occasion, and that they were engaged in improving their sanitary condition as well as could be done under the circumstances.

I enclose statement of expenses, etc., herewith.

Yours very respectfully,

WM. LEISER, JR.

3. REPORT OF MEDICAL INSPECTOR P. A. HARTMAN, M. D., OF AN INSPECTION OF THE SUSQUEHANNA AND JUNIATA RIVERS.

Benjamin Lee, M. D., Secretary State Board of Health.

DEAR SIR:—Your telegraphic order of the 6th instant reached me on the 7th; upon receipt of which an inspection of the Susquehanna and Cumberland districts was entered upon and covered a period of eight days.

The first work done was about Harrisburg, Steelton and the islands between Steelton and Marysville. Harrisburg, from above Washington avenue to the southern limits of the city, was completely covered by water and mud, as was also that portion of the city lying between the railroad and "Allison's Hill." There was very great difficulty in rescuing the people in the eastern portion of the city; however, through the great efforts of the mayor and his assistants the people were *all* saved.

The water in many localities filled cellars and houses to the second story. The city authorities, immediately upon the subsidence of the water, commenced with energy, the cleaning of the streets of logs and mud which the flood had deposited; also put the steam fire engines to work, pumping water out of the cellars, after which the mud was shoveled out and carted away; plenty of lime being used to assist in drying up, and disinfectants freely used.

In Steelton the flood reached up to the canal, in fact the same condition prevailed as in Harrisburg. The loss of life in Steelton was a mother and child; this occurred by the unfortunate upsetting of the boat by which men were trying to rescue them. Both of these towns are doing everything possible to clean up promptly and thoroughly.

On Sheesley's island, below Harrisburg, and on McCormick's island above, a number of carcasses of animals were discovered, most of which were covered by great piles of boom logs; wherever possible, they were taken out and buried, the others being covered with sand and lime. As soon as the logs can be moved the remains will be properly cared

for. Orders have since been given to use more powerful remedies, which will be carried out.

After completing the inspection in this locality, a boat was taken at Mahantango, at the upper limit of the district, and the river was followed down to Marysville. Both shores, and all the islands were inspected, upon a number of which carcasses were found and cared for. The shores of the river were generally found clear, only two carcasses being found between Mahantango and Columbia. This is accounted for by the fact that as the water fell, the drift was to the centre, so that nearly every thing lodged upon the islands or floated down the river to the bay.

At Harrisburg, the water was twenty-seven inches higher than in 1865, while above the Juniata, notably so at Millersburg, Dauphin county, the flood was a foot less; this is accounted for by there being no unusual flood in the North Branch.

The Juniata was next inspected, from Millerstown to its entrance into the Susquehanna. At Cocklemans creek, one mile east of Millerstown, a large drift was found which contained a large number of carcasses, six of which were buried; a number of others which could not be reached, were ordered to be burned with that portion of the drift holding them. Mr. McCombe and two others were employed to do the work.

Newport was visited en route and inspected. This town has about 2500 people, most of whom are poor. Here the damage to property was greatest. The town was largely overflooded. Cellars and houses filled with water and mud, making its sanitary condition very bad. Some aid should be given this town by the state for sanitation. Have so recommended to the Governor in a preliminary report, which you requested be sent him.

Below Middletown but two carcasses were found. The reason that all carcasses were not burned is this: They were mostly covered by logs and sawed lumber, which would also have been burned. For instance, on McCormicks island, which is a large one, between 40 and 50 acres were covered to an average of about fifteen feet. In this great pile of stuff are the carcasses entangled. However, they now lie high and dry and methods are used to prevent contamination of the water.

It is my pleasure to announce that no human remains were found or heard of. Not less than forty carcasses of animals were found and disposed of with small expense. I had with me one man for seven days, who rendered valuable assistance. The courtesy rendered me by Mr. Wister of Duncannon, Mr. McCormick and Sheriff Sheesley, is gladly acknowledged.

I have the honor to remain,

Yours respectfully,

PAUL A. HARTMAN, M. D.,

Special Inspector.

4.—REPORT OF PROFESSOR GEO. G. GROFF, M. D., OF AN INSPECTION OF THE FLOODED DISTRICT OF THE STATE EAST OF THE ALLEGHENIES.

HUNTINGDON, PA., *July* 29, 1889

To Benjamin Lee, M. D., Secretary Pennsylvania State Board of Health.

DEAR SIR:—The committee appointed to visit the flooded districts of the state have done so, and report as follows:

Williamsport was visited July 23d. The committee was met by Mr. J. H. Hayes, President, and Dr. A. Richter, Health Officer of the local health board, who conducted it to every portion of the city, which was found in an excellent sanitary condition, so that in most portions of the city, it is scarcely possible to see evidences of the recent deluge.

Jersey Shore was visited on the next day, July 24th. This place was found in a bad sanitary condition. The people have cleaned up the driftwood which filled their streets, but have done but little else to purify their town since the flood. We found the town plot covered with a green slimy mud (scarcely dry) from two to fourteen inches deep, the houses were reeking with moisture and a slimy mould. So damp are the stores that all kinds of goods purchased since the flood are moulding and spoiling. The cellars cannot be said to be cleansed and scarcely any whitewash has been used in the whole place. The stables, and nearly every house has one, have not been touched, and are full of stinking mud. The privies have all overflowed and been partly filled with mud. There are in this place some 256 contaminated wells, which have not been cleansed, but which the people are again commencing to use.

There is at Jersey Shore, within the town, a section of the State canal, which is in a very filthy condition, and detrimental to public health.

The population of Jersey Shore is about 3000. The drainage, surface; the water supply, from *wells* and from the river. The health officer is Dr. G. H. Cline.

The committee recommend that $2,000 be sent to Jersey Shore for sanitary purposes. That two car-loads of lime and two cases of bromine be sent there. So far as the committee could learn, this place had received no aid whatever for sanitary purposes. The work of sanitation here should be conducted under a competent inspector. The committee would call attention to the fact that the villages and isolated farm-houses along Pine, Larry's Beech and Antes creeks suffered *very severely*, and that *no relief*, of a sanitary kind, has been extended to them. Sickness will occur in these, just as well as in the larger towns, and they should receive from the State Board the same attention. It is recommended, therefore, that the villages and farms along the above named creeks, be placed under a competent inspector for the summer, and that he be furnished with supplies of disinfectants for his district.

Laurenceville and Tioga were visited on the 25th. Laurenceville has a population of about 500. The drainage is on the surface. The water supply is from driven wells. There are some dug wells, but these are at present not used. The town plot is flat, and there are some ponds filled with flood water, which have been a source of anxiety. The people here have been very diligent and have thoroughly cleansed their village, and driven a number of new wells. They have received no aid for sanitary purposes, and ask some for sinking of wells, or for indigent persons, also to drain ponds. The committee recommend that $250 be given Laurenceville for sanitary purposes; also disinfectants for the summer. Burgess Hill is acting health officer, assisted by Messrs. Daggett and Mather, these three forming the health committee.

Tioga has suffered severely, and except that the drift-wood has been removed, but little has been done to clean the town. The water supply is from the mountains, and is in nearly every house; dug wells are not used. The drainage is on the surface. The cellars are filled with a stinking mud, prejudicial to health. The churches and schoolhouse not yet cleansed. There is within this borough, a stream and pond filled with very offensive water from a tannery, which, if permitted to remain, cannot but prove a source of sickness this summer.

Population about 500. Health Officers, C. D. Farr and Dr. R. E. Smith. The committee recommend $1,000 and disinfectants for Tioga, and that the place be under the observation of a competent inspector all summer.

Dr. Smith reports an unusual amount of sickness, which he thinks due to the flood. The sickness is the same reported in all the flooded districts, and not elsewhere considered as caused by the flood.

Lock Haven was inspected on the evening of the 25th and the morning of the 26th. The committee called upon the mayor, G. W. Mason, and the President of the local health board, also upon Drs. Wall and Ball of the same board. The people and the officials here have been alert, and the committee report this city in an excellent sanitary condition. One car load of disinfectants more than needed is reported in this town. Population 7000. City water good.

The Nittany valley was visited July 27th. The flood here was on Fishing creek and its tributaries, which arose to a great height and did much damage.

Mill Hall is four miles from Lock Haven. Population 650, mostly laboring people. No loss of life during the flood. No sickness now attributable to flood. The water supply is from wells which were contaminated. Cellars are only partially cleansed. Sanitary condition only fair. Dr. Carrothers, physician. The committee recommend for Mill Hall $250 and a supply of disinfectants, as it has received nothing for sanitary purposes.

Salona is a village of 250 population. Five were lost in the village in flood, 7 in the township, 19 in the community. There is no present

sickness attributable to the flood. The water supply here is all right. Dr. L. W. Halloway has performed, in a very efficient manner, the self imposed duties of health officer. The committee recommend a small supply of disinfectants for Salona.

Flat Rock is a hamlet nearly destroyed by the flood. Six lives lost in one house. No need here except financial relief.

Mackeyville has a population of 124, lost 5 in the flood. Wells are contaminated, cellars dirty, people discouraged. The committee recommend $250 and a supply of disinfectants for this place. Dr. J. M. Dum, physician, reports no sickness attributable to the flood.

Clintondale suffered considerably, but people are in good heart and have cleansed their town. Population 200. Physician, Dr. J. H. Huston. The committee recommend small supply of disinfectants.

Yankeetown and Washington Furnace, three quarters of a mile beyond Clintondale need only financial relief, unless small supply of disinfectants, which might be sent in care of Dr. J. H. Huston of Clintondale.

Renovo was inspected on July 27th. This town did not suffer except along the river front. The water supply is from the mountains. Very few wells are used. Drainage on surface. Population 5,000. Sanitary condition fair. There is a health board here, but health matters are in the hands of the council, and Chief Burgess Ferguson acting health officer. Some of the physicians of the town reported a good deal of typhoid fever last season, but a heavy rain storm prevented the committee from visiting the reservoir from which the town water supply is drawn. At Renovo, the committee observed that the river banks are being encroached upon, narrowing the bed of the stream, and thus producing a condition to invite disastrous floods in the future.

Driftwood and Du Bois were rapidly inspected. There is no present sickness, and no need of the board to interfere.

Punxsutawney in Jefferson county, on Mahoning river, had all the lower parts flooded. This town lies on a very low plot of ground, which is covered with depressions filled with stagnant water. There is no system of drainage at all, the ground being too level for this on the surface. Water supply from the Mahoning river. Population 4,000. Physician S. S. Hamilton. The committee recommend that Punxsutawney be under the observation of an inspector all summer, or until the people form a local board of health, which they should be encouraged to do. The flooding was much less serious here than in any of the other places visited.

Huntingdon was visited on the 29th. The committee found but slight evidences of the flood here. A few houses had been washed away, but no lives lost. No sickness attributable to the flood. The committee were conducted over Huntingdon by Chief Burgess J. C. Blair and Dr. A. B. Brumbaugh. The following points were brought to the attention of the committee, and by them are considered as common nuisances

which should be abated at once. A considerable portion of abandoned canal bed lies in this town, some attempt has been made to drain this, but it has not been very successful. Three slaughter houses were found within the borough in a very unsanitary condition, large piles of bones and other offensive matter about them, rendering their neighborhood unendurable. These slaughter houses are also accustomed to throw the entrails, heads, etc., of slaughtered animals into the river, whence they float down, to the great detriment of the people living below. All these slaughter houses ought to be condemned at once, and an order made forbidding the throwing of their offal into the river. Some vacant lots were shown the committee, which were covered with filthy water. These lots ought to be filled. The committee inspected the refuse from a large chemical sink, said refuse being used to fill up lots and streets. The committee is not prepared to say that this material is detrimental to the public health.

Dr. A. B. Brumbaugh, Inspector of the State Board of Health, says that all the villages in Huntingdon county along the river, are now in good sanitary condition. He thinks that disinfectants would have been very acceptable in the early days following the flood, but he does not think they are now needed. The committee did not visit any of these villages.

The committee recommend that a thorough house to house inspection be made of Tioga and Jersey Shore, as only in this way can these places be thoroughly known and purified. From this tour of inspection, the committee see the great need of a larger number of medical inspectors, and the pressing needs of local boards of health. The districts of many of the inspectors is so large that they cannot have any reasonable oversight of the same.

Respectfully submitted,

GEO. G. GROFF, M. D., *Chairman.*
JOSEPH F. EDWARDS, M. D.

5.—ACTION OF THE BURGESS AND HEALTH OFFICER OF JERSEY SHORE.

Important Notice.

WHEREAS, An extraordinary emergency is upon us, our town having been traversed by flood:—It becomes the duty of all good citizens to use every effort in the maintainance of strict sanitary measures in order that disease be averted, and the health of our people preserved;

It is hereby ordered and required that the action of council in the creation of a board of health be sustained, and I call upon all persons to duly respect the authority of said board, and assist in the enforcement of strict sanitary measures.

WM. L. LEVEGOOD, *Burgess.*

A meeting of the committee appointed by council on Tuesday, June 6th, 1889, composed of P. D. Bricker, Jno. E. P[illegible] D. A. Bingham,

Dr. John Nevins and Dr. G. H. Cline, held at the office of Captain Potter, and organized by electing Jno. E. Potter, chairman; D. A. Bingman, secretary; after which they adjourned to report at meeting of the council on June 7th, at 7½ P. M. Council accept report of committee to appoint or create a board of health composed of the following persons: Jno. E. Potter, chairman; D. A. Bingman, secretary; Captain P. D. Bricker, Dr. John Nevins, Dr. G. H. Cline, adding the names of D. H. Strayer, Richard Callahan, Anson Underwood and James E. Nice, and electing Dr. G. H. Cline, health officer. Giving this board full power to act as a board of health under direction of council.

Extract from Minutes, June 8, 1889.

On motion of A. W. Brown, seconded by T. J. Coolidge, the sanitary committee or board of health appointed by the council, shall have full power and authority to act as said board.

The following rules have been made by the board of health, the strict observance of which will insure a better sanitary condition in our town, and all good citizens are requested to assist in enforcing them:

1st. To thoroughly cleanse all cellars, out-houses and stables, using whitewash freely.

2d. To remove all house refuse, offal and garbage from neighborhood of habitations, and either burn or bury it.

3d. To drain all wet places in the immediate neighborhood of dwellings, and thoroughly drain all cellars.

G. H. CLINE,
Health Officer.

Notice is hereby given to all persons owning or occupying property in the town, to immediately have their houses, cellars and yards cleaned, in order that the health of our citizens be preserved. The filth can be put into the streets, avoiding putting obstructions on sidewalks and in the gutters. Any one failing to comply with this notice, will be liable to a fine as provided by law.

It is important to clean up first, have it promptly done, after which the authorities will clean the streets. Disinfectants will be furnished. Post up in a conspicuous place.

JNO. E. POTTER,
Chairman, Board of Health.

Notice.

Chloride of lime for disinfectant purposes is stored at Bodine's ware house, Smith street, where it will be given out upon orders of the members of the board in quantities of five pounds and upwards. Parties

coming for it should bring a box or pail to carry it in. Apply to the member of your district for order.

JNO. E. POTTER,
Chairman Board of Health.

D. A. BINGMAN, *Secretary.*
JERSEY SHORE, PA., *June 13th*, 1889.

Directions for Using.

Put the chloride of lime in shallow vessels, moistened with water, and place them in closets, cellars, vaults and dark, damp places.

G. H. CLINE,
Health Officer.

REPORT OF THE HEALTH OFFICER OF JERSEY SHORE.

JERSEY SHORE, PA., *June 3d*, 1889.

Benjamin Lee, M. D., Secretary State Board of Health.

DEAR SIR:—Herewith find enclosed a report of the sanitary condition of Jersey Shore, Pa., after the flood of June 1st, 1889.

Before proceeding with a detailed account of the condition of our town after the water subsided, I will give statement of water supply, sewerage etc., which will enable you to see from statement as presented, the sanitary condition of our place at present time.

The water supply for the town is taken from the Susquehanna river by being pumped into a reservoir situate at an altitude of one hundred and thirty feet above the town; from thence it is conveyed through the streets by mains, from which the supply to the dwellings is taken; at present, this water supply is used by about one sixth or seventy dwellings, and about forty dwellings are partially supplied, making in all about ninety dwellings out of four hundred and nine that are supplied from the water works; the balance of the dwellings (three hundred and nineteen) are supplied with water from ordinary open wells, with the exception of about ten dwellings that have driven wells. The open wells range in depth of from 25 to 40 feet, walled principally with loose stone and in many instances, insecurely closed at curb.

There are four main sewers leading from central part of town eastward to river, and two on Allegheny street, leading eastward into Lawshe run; the balance of the town (about one third) west of Pennsylvania canal, is without sewerage. In that part of the town supplied with sewers, about one half of the dwellings use them for sewage, thus leaving the most of the town to use privies and vaults.

The surface drainage in many places is insufficient and cesspools are used. By the floods of June 1st, 1889, the water ranged from six to ten feet in depth in most of the town. About ten dwellings had no water on first floor, but in almost every case the cellars and wells were submerged. After the water subsided the streets and alleys were impassible, being filled with mud and filth to the depth of several inches, and in

places débris, sawlogs, boardwalks, fences, outhouses, etc., from which the stench of dead animals emanated. The average of deposit was about one inch to the foot of water, finding its way into every crevice, partition, coping, wall, sill, cellars, wells, small sinks and cess pools. Out houses and privies were carried away, and the contents of their vaults became part of this solution that filled cellars, wells, etc., Two hundred and fifty-six wells, some partially, others almost entirely, filled with this filth are abandoned; others must of necessity be contaminated. Some are being used, but the water (I think) is of a dangerous character.

The sewers are damaged in many places so as to obstruct sewerage, and the health of our people is endangered, unless they are at once placed in a good condition.

To summarize—To cleanse and disinfect 409 cellars, costing each $15,	$6,135.00
To cleansing and repairing 319 wells, at $16.50 each,	5,263.50
To disinfecting abandoned wells,	200.00
To replacing building fences, walks, etc..	400.00
To cleaning streets,	2,000.00
Total expense,	13,998.50

In conclusion, the above estimate has been prepared with care, and our expense will fully reach these figures. Upon a large number of our people the tax will fall heavily indeed; many are unable to subsist and maintain their families, and do the necessary amount of work and expense on their premises, to insure a safe sanitary condition. We fully realize our condition and to our friends we appeal for aid.

Respectfully submitted,

G. H. CLINE, M. D.,
Health Officer.

6.—REPORTS OF MEDICAL INSPECTOR E. D. PAYNE, M. D., AND T. B. JOHNSON, M. D., OF AN INSPECTION OF THE WEST BRANCH OF THE SUSQUEHANNA AND ITS TRIBUTARIES.

TOWANDA, PA., *June 15th*, 1889.

Benjamin Lee, M. D., Secretary State Board of Health.

SIR:—At nine A. M., of Friday, June 7th, I received the following telegraphic dispatch, dated at Pittsburgh, Pa., 6-6-89.

"*To Dr. E. D. Payne, Medical Inspector*:—You are hereby directed to proceed without delay, taking with you one other physician to inspect the sanitary condition of all flooded regions in your district, with full authority to employ laborers in the name of the state, to discover dead bodies of human beings and animals, burning the latter with the débris; send report here.

"BENJAMIN LEE, *Secretary.*"

At that time I had no information of the destruction of life in Bradford county, though I knew that several creeks had been flooded and much property destroyed, and subsequent events have not brought such information. There were no reports from Tioga or Potter counties, from which reliable information could be obtained, by reason of interrupted railroad communications. So far as I could learn by rumor, those two counties had not suffered; but I supposed that Sullivan had suffered to some extent, and Lycoming in a greater degree. I therefore made the West Branch of the Susquehanna my objective point, and together with Dr. T. B. Johnson of this place, I started for there at 3 P. M. of the same day I received the dispatch.

It was impossible to reach there by rail, all communication with it being cut off by reason of the destructive flood; so I determined to take a pair of horses and light wagon, and travel through Sullivan county, striking the headwaters of the Loyalsock creek, and follow it down. The route by way of Dushore, Laporte, and Eaglesmere, was not practicable. The route we took, was therefore, the only one open to us; and I concluded that whatever lifeless bodies there might be, they would be carried to the Susquehanna, and there interrupted in their course by the lumber and logs in the river. Subsequent knowledge justified me in this conclusion. We reached Forksville, a distance of twenty-six miles, that evening, and broke an axle to our wagon about half a mile this side. It was repaired for us at the village, and we were enabled to start again in the morning. Passing through Hillsgrove and Proctorville, we again broke our wagon while fording Bear creek at Barbours'. This necessitated our getting back to Proctorville, a distance of two miles, for repairs. Mr. Dutton, superintendent of the works, gave us all needed assistance, and we again proceeded on our way, passing through Loyalsockville, and reaching Montour by evening, having ridden forty-four miles. That day the road was exceedingly rough and difficult over that part of the way, necessitating the fording of streams, crossing the mountain, and riding during a heavy rain. The destruction of property consisted mostly of the carrying away of bridges, washing away of land and destruction of crops. We neither saw nor heard of any loss of life until reaching Proctorville, where one man, and some small stock, were reported to have been drowned and swept down the stream. These were not lodged at any point on the creek that we could discover or hear of, and were probably swept on to the river.

On our arrival at Montours, I put myself in communication with the burgess, Mr. Frank R. Konkle, that evening, and made an engagement with him to show us over the drift in the borough limits the following morning. The borough is a very neat and cleanly kept place, in quadrangular shape, with sides two miles long. Mr. Konkles' account of the methods to preserve health was interesting, his ideas good, and

the town healthy; but a detailed description would be out of place here.

We spent the following forenoon on the drift. It consisted of from fifty to seventy-five acres of logs, lumber and débris; in places from fifteen to thirty feet high. It was estimated that to move this mass, it would require a force of five hundred men for six months. It had now been ten days since the flood, yet a walk over a greater part of the drift gave very little evidence of the decaying animal matter within it; certainly not such as would justify me in the outlay necessary to prove or disprove its presence. It was believed that most, if not all, the bodies had been reclaimed from the river at Williamsport, six miles above. It seemed unnecessary for me to remain there; but I showed Mr. Konkle your dispatch, and made an arrangement with him, by which, if bodies or carcasses were discovered, the one should receive burial, and the other be burned. For the performance of this, he is to send you duly certified bills for payment. We now learned that Williamsport was open to the southward by the way of Sunbury; and as we could not get into Tioga county by wagon, except by retracing our way over the mountain to Canton, we hired a driver to bring our team home from Montours, starting it Sunday afternoon. It arrived here in good condition Monday evening. About one P. M. we left on the train for Williamsport. On our arrival there, I called on Dr. Reichart, president of the city board of health. The result of the interview may be summarized in his words; "tell Dr. Lee, we will be in good condition by the end of another week." The wreckage and destruction of property in and about the city, by reason of the flood, was very great. There had been twenty-five or thirty bodies of human beings recovered from the river, and these had been claimed by their friends and buried. Quite a number of carcasses, how many he could not say, had been taken from the river and also buried. Dr. Reichart thought there need be no further apprehension from this source; that the river at that place had been virtually freed from dead animal matter. My observation would lead me to apprehend more danger to the city from the flooding of houses and cellars, and tearing up of sewer pipes and water closets, leaving a deposit of filth wherever water had flowed. This was being systematically looked after, to avert sickness. Each one of the board of health has a ward assigned to him; windows and doors are kept open for free ventilation; cellars were being pumped out and cleaned; lime, as an absorbent, was being used to the extent of every call, and disinfectants abundantly. Dr. Reichart seems to be an enthusiast on the subject fo sanitation, and rigid cleanliness as a chief means to that end. When I had finished my interview with him, it seemed to me that I was an unnecessary element in that locality. After a walk about the city, which seemed to confirm all that Dr. Reichart had said, we left for Sunbury that even-

ing, and remained there over night. The next morning we took the train for Wilkes-Barre, and arrived home before night.

In reviewing the result of our four days trip, it would at first appear that there was no fruit to show for our labor, as indeed we did no actual work; yet, I hope the knowledge gained of the actual state of affairs, at a point which would naturally cause apprehension, may be some compensation.

I send herewith bills rendered necessary by this inspection.

Respectfully submitted,

E. D. PAYNE, M. D.,
Inspector for Lycoming District.

I fully concur in the above.

T. B. JOHNSON, M. D.

TOWANDA, PA., *June 20th*, 1889.

SIR:—On the morning of the 11th, after returning from the West Branch, I saw by the papers there were fears of much damage from the flood in Tioga county. Up to that time, there had been very little information from there. Believing that it was full time for action, if there was any need of it, I immediately went to Elmira for the purpose of finding out whether or no, I could get through to the interior of the county. For that purpose I visited the Tioga office branch of the New York, Lake Erie and Western (commonly called the Erie) railroad, and was informed by Mr. William Buck, that as yet there was no certainty of getting beyond Lawrenceville or Tioga, but that in a day or two the road would be open, not only on the branch through Mansfield, but connection at Lawrenceville would be made through to Wellsboro. His information was to the effect, that not only had there been considerable destruction of property, but some destruction of life, especially among animals. But his information on subjects not immediately connected with his road was indefinite, and made up more of speculation and of rumors than exact knowledge. I next visited Dr. Henry Flood, an eminent practitioner of the city and also postmaster. He was now sending mail through Tioga county; partly by rail, partly by wagon, and in some sections by horseback. He appeared quite confident from information he had, that there was no need of my going there. He said I could reach Mansfield by going to Troy by rail, thence to Mansfield by wagon, and thought I could there hire some one to take me across to Wellsboro. In view of the fact that I was not in condition to travel in that manner, that the railroads would be open in two or three days more, and that there might be no need of my going at all, I adopted another plan, namely, returning home. I sent the following telegram to Dr. Smith, Tioga; Dr. Elliott, Mansfield; Dr. Bacon, Wellsboro:

TOWANDA, PA., *June 11th*, 1889.

Is there need in your vicinity or county resulting from recent floods, for visit from health officer? Answer here.

E. D. PAYNE, *Inspector Lycoming District.*

To this I received replies in the following order:

TOWANDA, PA., 6*mo.*, 12, 1889.

No. We are doing everything possible to clean up.

R. B. SMITH.

MANSFIELD, PA., 6, 12, 1889.

Think there is no necessity for a visit in this vicinity. Cannot say how it is in Tioga village or Lawrenceville.

C. H. ELLIS.

WELLSBORO', 6, 12, 89.

Are few carcasses in this region that should be buried. Sheriff will attend to it if he receives authority from you. It may be necessary for you to visit Tioga and Lawrenceville. Sheriff can meet you there.

M. L. BACON.

Upon the receipt of the last, I determined to start on the following morning, the 13th. Unfortunately I was sick all night, and not in a fit condition to go; and knowing that whatever was necessary to be done should be done immediately, I telegraphed Dr. Bacon as follows on that day: Tell Sheriff bury all bodies of human beings, and burn all carcasses of animals immediately. Letter follows.

E. D. PAYNE, *Inspector Lycoming District.*

On the 14th I wrote the sheriff as follows:

TOWANDA, PA., *June 14th*, 1889.

To the Sheriff of Tioga County, Pa.

DEAR SIR:—On the 11th instant I sent a dispatch to Dr. Bacon, asking if there were any need of health officer visiting your county, dependent on the recent floods.

He replied, he thought there were a few carcasses throughout the county, and that you would bury them if requested. On the receipt of his dispatch, I determined to go to your county and ask you to act in connection with me for the proper disposal of them. Unfortunately I was taken sick that night, and am not at present in proper condition to go. As the matter requires urgency, I yesterday sent him a dispatch saying, "tell sheriff burn all carcasses immediately." My instruction from Dr. Lee, Secretary of the State Board of Health, is to bury the bodies of human beings, and burn the carcasses of animals. I therefore request that you will take the matter in hand immediately, following the instructions of the State Board of Health, properly burying the bodies of unclaimed human beings, and burning with driftwood, the carcasses of all animals found. So long a time has now in-

tervened since the flood, that the work should be accomplished as expeditiously as possible; first, on account of the health of the people, and second on account of the disagreeable task of handling dead bodies and carcasses.

Bills for the work will be paid by the State Board of Health, and should be made out to it. Please send them to me, reporting the number of dead bodies buried and carcasses burned, together with the localities where they are found, and I will forward them to Dr. Lee.

Up to this time, I have received no reply or report from him. I send enclosed bills of necessary expenses incurred in this connection.

Respectfully submitted,

E. D. PAYNE, M. D.,
Inspector of Lycoming District.

7.—FINAL REPORTS OF THE COMMITTEE ON THE FLOODED REGIONS WEST OF THE ALLEGHENIES.

November 15th, 1889.

To the State Board of Health of Pennsylvania.

GENTLEMEN:—Your special committee appointed to have an oversight of the flooded areas of the West branch of the Susquehanna river and of the Juniata river, respectfully report, that these valleys were under constant surveillance since the last report. The chairman was in communication with parties residing in the worst devastated places, and as no reports reached him of any sickness beyond the control of the local authorities, no visits were made to any points except to Lock Haven, Williamsport, Milton, Sunbury and Lewisburg. At Lock Haven there has been more sickness than is usual, but it is a result of the flood, and within the control of the city authorities.

An inspection of the district was made by Dr. J. F. Edwards and Mr. Howard Murphy, just before the annual meeting of the board, and their report accompanies this report.

Your committee cannot but express great gratification that there has been so little sickness in these flooded regions, and at the same time, your committee feel that in view of the very liberal aid given by the state to the people of the valley of the Conemaugh, the people of the valleys of the West Branch and of the Juniata should have been more freely aided, especially does this apply to the dwellers in small villages and on isolated farms, who, from this very isolation, suffered the more severely, and needed the greater aid. Your committee feel, however, that at this time, winter approaching, the board can safely declare the districts named, as no longer in a condition dangerous to the public health.

Respectfully submitted,

GEO. G. GROFF, M. D.,
Chairman.

November 15th, 1889.

George G. Graff, M. D., Chairman, etc.:

The sub-committee, appointed by you to visit certain towns along the West Branch of the Susquehanna river, has the honor to report that it visited Jersey Shore on Friday, November 8th, and there met Dr. G. H. Cline (the health officer,) Captain Bricker, and many other prominent citizens. From a sanitary point of view, Jersey Shore is now in a fairly satisfactory condition: the authorities seem contented, if not satisfied, with the amount of extraneous aid that they have received, and with the exception of the condition of the abandoned canal, we think that Jersey Shore may be considered to be in such a condition that it is no longer a menace to its own health, or that of its neighbors.

From Jersey Shore, the committee proceeded to Tioga, where it had interviews with Mr. Fred. Smith, with the mayor and other prominent citizens. We may say that the people of Tioga seem quite well satisfied with their present condition, and the committee saw no reason to dissent from this view.

Lawrenceville, the next and last place visited, suffered mainly in the pollution of the wells constituting the water supply of the village. The committee is glad to be able to report that these polluted wells have been, practically, universally abandoned, and it is in contemplation to furnish a pure water supply to the town. At Lawrenceville, your committee had interviews with Chief Burgess Hill, Mr. Daggett, of the health committee, Mr. Mather, Mr. Rusling and other prominent citizens.

Surveying, in a general way, the section of country traversed by the committee, it would seem proper to say that the people have recuperated with wonderful energy, from the effects of the floods; there is not an unusual amount of sickness; there is quite general satisfaction with the aid that has been given, and there is a universal kindly sentiment towards the State Board of Health for its watchfulness, advice, care and assistance. All of which is respectfully submitted,

JOSEPH F. EDWARDS,
Chairman Sub-Committee.

8.—SHIPMENTS OF DISINFECTANTS FROM JOHNSTOWN TO OTHER FLOODED REGIONS.

JOHNSTOWN, PA., *September 19, 1889.*

Dr. Benjamin Lee, Secretary State Board of Health.

DEAR DOCTOR.—I have the honor to submit the following report of disinfectants shipped this day:

Burgess of Carbondale, Pa.,	Five (5) bbls. lime. Two (2) cases sod. hypo. One (1) case carbolic acid.
Burgess of Milton,	Five (5) bbls. lime. Two (2) cases sod. hypo. One (1) case of carbolic acid.

Postmaster of Mexico, Pa.,	Two (2) cases sod. hypo. Five (5) bbls. lime. One (1) case carbolic acid.
Postmaster of Montandon,	Five (5) bbls. lime. Two (2) cases sod. hypo. One (1) case carbolic acid.
Burgess of Middletown, Pa.,	Five (5) bbls. lime. Two (2) cases sod. hypo. One (1) case of carbolic acid.
Postmaster of Liverpool, Pa.,	Five (5) bbls. lime. Two (2) cases sod. hypo. One (1) case carbolic acid.
Postmaster of Mile Run,	Five (5) bbls. lime. Two (2) cases sod. hypo. One (1) case carbolic acid.
Watsontown Postmaster,	Three (3) bbls. lime. One (1) bbl. zinc chlor. Two (2) cases sod. hypo.
Dr. J. M. Dunn, Mackeyville,	Three (3) bbls. lime. One (1) bbl. zinc. chlor. Two (2) cases sod. hypo.
Dr. Carrothers, Mill Hall,	Three (3) bbls. lime. One (1) bbl. zinc chlor. Two (2) cases sod. hypo.
Dr. G. H. Cline, Jersey Shore,	Three (3) bbls. lime. One (1) bbl. zinc. chlor. Four (4) cases sod. hypo.
Dr. L. W. Halloway, Salona,	Three (3) bbls. lime. Seven (7) cases sod. hypo. One (1) bbl. zinc chlor.
Dr. J. H. Huston, Clintondale,	Three (3) bbls. lime. Two (2) cases sod. hypo. One (1) bbl. zinc chlor.
Montgomery Station Postmaster,	Three (3) bbls. lime. Two (2) cases sod. hypo. One (1) bbl. sulpho napthol.
Muncy Postmaster,	Three (3) bbls. lime. Two (2) cases sod. hypo. One (1) bbl. sulpho. napthol.
Burgess Hill, Lawrenceville,	Three (3) bbls. lime. One (1) bbl. sulpho napthol. Two (2) cases sod. hypo.
Dr. S. S. Hamilton, Punxsutawney,	Three (3) bbls. lime. One (1) bbl. sulpho napthol. Two (2) cases sod. hypo.
C. D. Farr, Tioga,	Three (3) bbls. lime. One (1) bbl. sulpho napthol. Two (2) cases sod. hypo.

Total amount of disinfectants shipped.

Sixty-eight (68) bbls. lime.
Forty-three (43) cases sod. hypo.
Six (6) bbls. zinc chlor.
Five (5) bbls. sulpho napthol.
Eighteen (18) half-gallon bottles carbolic acid.
Twelve (12) pint bottles carbolic acid.

W. E. MATTHEWS.
per M. E. BENNETT, *Clerk.*

JOHNSTOWN, *August 7, 1889.*

Mr. Sill is authorized to ship lime as follows:

To C. D. Farr, health officer, Tioga county, ... 4 Barrels.
To Burgess Hill, health officer, Lawrenceville, Tioga county, .

To Dr. S. S. Hamilton, Punxsutawney, Jefferson county,	5	barrels.
To. A. B. Bumbaugh, Huntingdon, Huntingdon county,	5	"
To Renovo, Clinton county,	5	"
To Postmaster, Muncy. Lycoming county,	5	"
To Postmaster, Montgomery Station, Lycoming county,	5	"
To Postmaster, Watsontown, Northumberland county,	5	"
To Burgess, Milton,	5	"
To Lewisburg, Union county,	5	"
To Postmaster, Montandon, Northumberland county,	5	"
To Sunbury, Northumberland county,	5	"
To Burgess, Duncannon, Perry county,	5	"
To Postmaster, Liverpool, Perry county,	5	"
To Burgess, Middletown, Dauphin county,	5	"
To Dr. G. H. Cline, health officer, Jersey Shore,	10	"
To Dr. Carrothers, Mill Hall, Clinton county,	2	"
To Dr. L. W. Halloway, Salona, Clinton county,	2	"
To Dr. J. M. Dunn, Mackeyville, Clinton county,	1	"
To Dr. J. H. Huston, Clintondale, Clinton county,	2	"

JOHNSTOWN, *August* 3, 1889.

Mr. Sill is hereby authorized and instructed to send by freight, the following disinfectants, to the places named:

Punxsutawney, 3 barrels lime, 1 barrel sulpho naphthol, 2 boxes soda hypochlorate, Werter's disinfectant.

Tioga, 3 barrels lime, 1 barrel sulpho naphthol, 2 boxes soda hypochlorate, W's disinfectant.

Lawrenceville, 3 barrels lime, 1 barrel sulpho naphthol, 2 boxes soda hypochlorate, W's disinfectant.

Muncy, 3 barrels lime, 1 barrel sulpho naphthol, 2 boxes soda hypochlorate, W's disinfectant.

Montgomery station, 3 barrels lime, 1 barrel sulpho naphthol, 2 boxes soda hypochlorate, W's disinfectant.

Watsontown, 3 barrels lime, 2 boxes soda hypochlorate, 1 barrel zinc chloride, W's disinfectant.

Mill Hall, 3 barrels lime, 2 boxes soda hypochlorate, W's disinfectant, 1 barrel zinc chloride.

Mill Hall, 3 barrels lime, 2 boxes soda hypochlorate, 1 barrel zinc chloride, W's disinfectant.

Jersey Shore, 3 barrels lime, 4 boxes soda hypochlorate, 1 barrel zinc chloride, W's disinfectant.

Mill Hall, 5 barrels lime, 7 boxes soda hypochlorate, 12 barrels zinc chloride, W's disinfectant.

Mill Hall, 3 barrels lime, 2 boxes soda hypochlorate, 1 barrel zinc chloride.

9.—CIRCULAR OF INFORMATION DISTRIBUTED IN EVERY BOROUGH AND VILLAGE IN THE FLOODED DISTRICT.

State Board of Health of Pennsylvania—Important Circular of Information.

Although the public health is excellent, notwithstanding the recent floods, it is important that the people of ——— and surrounding villages should be instructed as to the best means of maintaining the present favorable condition. The State Board of Health for this purpose issues this circular.

The houses should be kept open as freely as possible, in order to dry them. It would be well to keep fires burning in all the houses to prevent dampness. *All dampness and mould must be banished as soon as possible.* Hence all wet carpets, clothes, blankets, etc., should be washed and hung out to dry without any delay whatever. *Collections of wet carpets, blankets, etc., must not be permitted.* Cellars should be *thoroughly cleaned*, and the windows kept *constantly open.* The cellar floor should be well sprinkled with disinfectants. Be sure to clean out all the corners in the cellar *thoroughly.* Don't leave dirt in it or on the walls. Whitewash as soon as you can get lime, not once, but several times during the summer. Boxes of quick lime placed in the cellar will greatly dry the air and make the cellar wholesome. Clean up the yard and burn all the rubbish soon as possible. All decomposing vegetables and meats should be thoroughly burned. Disinfectants should be freely used in and around privies. It would be well to clean all the privies with an odorless excavator.

Personal cleanliness should be carefully attended to. Bathe the body daily. Sleep in a room with the windows wide open, though draughts of air should be avoided. Beds should be supplied with blankets rather than sheets; and the body should always be covered at night, though but lightly, when the weather is very warm. The clothing should be kept clean. All underclothing should be washed frequently.

Well water should not be used if it is possible to avoid it. Reservoir water is the safest to drink. It would be well to *boil all water to be used as a beverage* or for culinary purposes. Women and children who can go for a few weeks into the country or to the homes of friends at a distance should do so.

By authority of the State Board of Health.

GEORGE G. GROFF, M. D.,
JOSEPH F. EDWARDS, M. D.,
Members State Board of Health.

BENJAMIN LEE, M. D.,
Secretary and Executive Officer.

10.—COMMUNICATION TO HIS EXCELLENCY GOVERNOR BEAVER, DECLARING THE NUISANCE IN THE FLOODED REGIONS WEST OF THE ALLEGHENIES ABATED.

STATE BOARD OF HEALTH, EXECUTIVE OFFICE.
PHILADELPHIA, *November 18th* 1889.

His Excellency, James A. Beaver, Governor of the Commonwealth of Pennsylvania.

SIR:—On the 14th day of June last, I had the honor to address you a report, based upon the report of inspections made by eight medical inspectors of this board, of the regions along the West branch of the Susquehanna and the Juniata rivers. In accordance with the facts contained in those reports, I, at the same time, made official declaration in the name of the State Board of Health, of the existence of a nuisance prejudicial to the public health, in the towns along the rivers in the aforesaid regions: and, inasmuch as the proportions of said nuisance were so extensive as to make it impossible for the local authorities to remove and abate it, I called upon your Excellency to at once employ such means as might be necessary to effectually remove and abate the same. I have now the honor to report that this work has been brought to a successful termination. These towns have been visited, not only by the district inspectors of the board, but also by individual members of the board acting under instructions from your Excellency, and by a committee of the board itself.

The board has sent disinfectants in considerable quantities to these places, together with printed circulars, instructing the people how to make use of them, and how, in other ways so to cleanse their houses and grounds, as to prevent disease as a result of the flood.

Your Excellency has also rendered them pecuniary aid in several instances, to enable them to carry out these instructions.

A committee of the board has recently made a final inspection of these districts, whose report indicates that there is no longer any occasion for outside assistance for protecting the public health. I therefore, in the name of the State Board of Health, declare the nuisance in these districts removed and abated, and request that no further aid be extended to them by the state.

I have the honor to be,

Your Excellency's most obedient servant,

BENJAMIN LEE,

Secretary and Executive Officer, State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania.

FINANCIAL STATEMENT.

BENJAMIN LEE, M. D., *Secretary of the State Board of Health of Pennsylvania, in Account with Governor Beaver, in abatement of nuisances caused by Floods of May 31st, 1889.*

Dr.

To amount paid by Governor Beaver personally, on Dr. Matthew's orders, 17 June, 1889,		$11.00
To check from Governor Beaver, 24 June., 1889,		4,000.00
	14 Aug., 1889,	3,000.00
	1 Oct., 1889,	10,000.00
	9 Sep, 1890,	356.00
Amounts received from Quarter Master General, Col. Samuel W. Hill, and Accounting Officer, Lieut. Col. Joseph H. Gray:	6 July, 1889,	496.90
	6 July, 1889,	83.75
	6 July, 1889,	1,440.00
	6 July, 1889,	432.78
	6 July, 1889,	696.55
	6 July, 1889,	1,321.25
	6 July, 1889,	1,197.90
	6 July, 1889,	944.55
	20 July, 1889,	5,611.55
	20 July, 1889,	1,725.25
	3 Aug., 1889,	3,086.13
	3 Aug., 1889,	167.25
	3 Aug., 1889,	877.00
	17 Aug., 1889,	2,190.20
	17 Aug., 1889,	337.25
	14 Sep., 1889,	1,199.38
	7 Oct., 1889,	434.82
To sale of merchandise (returned,)		183.42
To sale of house used by State Board of Health,		75.00
To balance of Pittsburgh account,		27.09
To balance,		43.73
		$39,928.75

Cr.

By services of deputy medical inspectors, residents of Johnstown,	$4,018.44
By services of medical inspectors of the Board at Johnstown,	180.00
By services of other physicians, including searching for and burial of animals,	135.00
By services of medical inspectors of the Board in other flooded regions,	720.13

By expenses of members of Board, meeting at and inspection of Johnstown and district,	307.73
By expenses of members of Board inspecting other flooded regions,	340.06
By travelling and other personal expenses of Dr. Benjamin Lee, Secretary of Board,	252.84
By wages of clerks, cooks, messengers and all other office employés in Johnstown,	3,369.97
By wages of superintendent and other employés at morgue in Johnstown,	732.00
By manual labor in Johnstown,	10,438.48
By team labor, including saddle-horses,	4,467.76
By supplies, including provisions,	2,183.62
coal,	8.70
printing and stationery,	458.39
sundries,	990.32
disinfectants,	8,291.14
By rents,	259.98
By new buildings,	495.78
By analyses of city water,	90.00
By Pittsburgh account, not previously included:—viz	
Sheriff's expenses, searching for and burial of animals, etc.,	234.88
Medical inspector of State Board of Health.	240.00
Manual labor,	835.56
Provisions and sundries,	218.60
Patrolling of rivers by steamer, etc.,	659.37
	$39,928.75

In addition to the above expenditures, the amount of $617.02 was paid by the Accounting Officer, Col. Gray, directly to individuals in the employ of the Board, and did not pass through the hands of the secretary.

APPENDIX F.

QUARANTINE, EPIDEMICS, AND SPECIAL SOURCES OF DISEASE.

I. How rags and bandages are disposed of in forty-eight Institutions in Pennsylvania.
(a). Communication from the Board of Health of Philadelphia.
(b). Secretary's Report.
II. Vaccination of Public School Children.
III. Cremation Furnace for Quarantine Hospitals.
(a). Letter by Dr. M. L. Davis.
(b). Description and Plan of Furnace.
IV. Small-Pox at Pittsburgh.
V. Sanitary Needs of Carbondale.
VI. False Certificates.
(a). Complaint of State Board of Health of Ohio.
(b). Report of the Special Committee.
VII. Small-Pox at Wilkes-Barre.
VIII. Small-Pox at Kingston, Luzerne county.
IX. Small-Pox at Nanticoke, Luzerne county.
X. Small-Pox at Glen Lyon, Luzerne county.
XI. Typhoid Fever at Nanticoke.
XII. Diphtheria at Gallitzin, Cambria county.
XIII. Quarantine at Cape Henlopen.
(a). Appointment of Dr. Benjamin Lee as United States Commissioner.
(b). An act to cede certain lands to the United States.
(c). Notice from J. F. Saulsbury, State Department of Delaware.
(d). Report of Dr. Benjamin Lee.
XIV. Extracts from Memoranda made by Dr. Charles M. Cresson Relative to Water Supply and Disease in the city of Philadelphia.
XV. Note from Supervising Surgeon General relative to the use of the Steamer at Quarantine.
XVI. An Act to Prevent the Spread of Contagious Diseases among Domestic Animals.

I.—HOW RAGS AND BANDAGES ARE DISPOSED OF IN FORTY-EIGHT INSTITUTIONS, IN PENNSYLVANIA.

(a.) COMMUNICATION FROM THE BOARD OF HEALTH OF PHILADELPHIA.

PHILADELPHIA, *March 14th*, 1889.

Benjamin Lee, M. D., Secretary of the State Board of Health.

DEAR SIR:—It has come to the notice of the board of health that hospital rags and bandages, not treated, after use find their way to dealers

in rags. A bale of rags containing material of this kind was seized by the board of health a few days since and destroyed.

This information will be mailed to each of the hospitals in this city, requesting an investigation for the purpose of preventing a recurrence of such violation of sanitary rules. Will you kindly communicate with the several hospitals throughout the state, the necessity of an inquiry as to whether such material could be disposed of to purchasers of rags.

Although unable to trace the rags to any definite locality it is supposed they were received from a dealer in the interior of the state.

Respectfully yours,

WM. P. TROTH,
Chief Clerk.

(b.) SECRETARY'S REPORT.

In compliance with a request contained in the above communication, the Secretary of the State Board of Health addressed inquiries to 125 public institutions in the state. Up to the present time replies have been received from 48 of these institutions. Of this number, 33 replies state that they burn their rags and bandages; 3 disinfect before selling them; and 12 wash prior to selling or disposing of them.

STATEMENT *of replies with reference to the manner in which rags and bandages are disposed of in Hospitals and other Institutions, with name of each Institution.*

NAME OF INSTITUTION.	HOW DISPOSED OF.
Temporary Home for Destitute Women, Pittsburgh,	Burned.
Allegheny General Hospital,	do.
Homestead, Allegheny county,	do.
Homœopathic Dispensary, Pittsburgh,	do.
Allegheny City Hospital,	do.
Sunbury Poor House,	do.
Allegheny County Home,	do.
Blakely Poor House,	do.
Poor House, Phœnixville,	do.
Bradford Hospital,	do
Westmoreland County Home,	do.
Northampton County Alms-House,	do.
Dauphin County Alms-House,	do.
The Altoona Hospital,	do.
City Hospital, Wilkes-Barre,	do.
Washington County Childrens' Home,	do.
Reading Hospital,	do.
Delaware County Home,	do.
Chester County Home,	do.
St. Francis Hospital, Lancaster,	do.
Christian Home for Women, Allegheny,	do.

NAME OF INSTITUTION.	HOW DISPOSED OF.
Rouse Hospital, Youngsville,	Burned.
Home for Children, Wilkes-Barre,	do.
Home for the Friendless, Allegheny,	do.
Slate Quarry Hospital, Nanticoke,	do.
Allegheny City Home,	do.
Mercy Hospital, Pittsburgh,	do.
Blair County Alms-Houses,	do.
Meadville City Hospital,	do.
Directors of the Poor, Mercer county,	do.
Crawford County Infirmary,	do.
Children's Home, Greene county,	do.
Children's Infirmary Home, Pittsburgh,	do.
Erie Home for Friendless,	Disinfect before selling.
Protestant Home for Incurables, Pittsburgh,	do.
Lehigh County Alms-House,	do.
Erie County Alms-House,	Wash before selling.
Williamsport Hospital,	do.
Franklin County Alms-House,	do.
York County Hospital,	do.
House of the Good Shepherd, Troy Hill, Allegheny,	do.
Cambria County Alms-House,	do.
St. Paul's Orphan Home, Butler,	do.
St. Joseph's Convent, Norristown,	do.
Children's Aid Society Home, Greensburg,	do.
Luzerne County Poor House,	do.
Home for Widows and Single Women, Reading,	do.
Tioga County Alms-House,	do.

II.--VACCINATION OF PUBLIC SCHOOL CHILDREN IN SOUTH BETHLEHEM.

To the Secretary State Board of Health.

SIR:--After a careful investigation into the measures taken to comply with the resolution concerning vaccination, as a means of preventing the contraction of small pox, adopted by the town council of the borough of South Bethlehem, in the year 1882, I find that out of the eleven hundred (1100) pupils, attending the public schools of this borough, one hundred and twenty-four (124) have never been vaccinated. In the majority of these cases, parents have deferred the matter of vaccination to comply with instructions received from physicians, viz: that *this* was rather a hazardous time to vaccinate. I would also state that about 70 per cent. of the number vaccinated, *were* vaccinated during the year 1882, and not since; about 5 per cent. of them, prior to the year 1882, and not since: and about 15 per cent. since the year 1882.

A comparatively small number have been re-vaccinated, perhaps about 4 per cent.

Respectfully submitted,

OWEN R. WILT,
Superintendent of Public Schools.

III.—CREMATION FURNACES FOR QUARANTINE HOSPITALS.

(a.) LETTER OF DR. M. L. DAVIS.

Benjamin Lee, M. D.

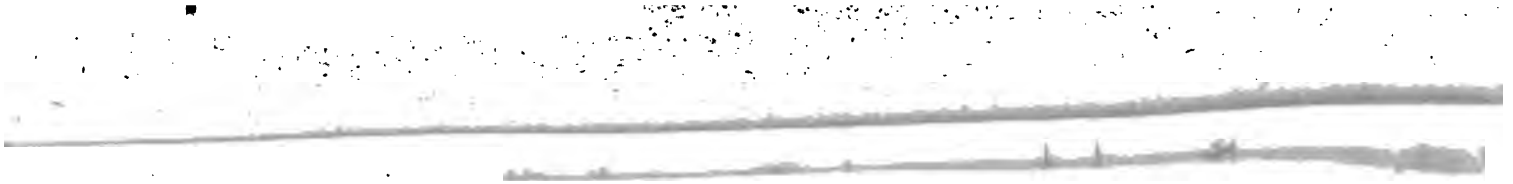
DEAR SIR:—I have been at work at a quarantine hospital for some time, with a cremation furnace so arranged that all air impregnated by patients should be destroyed by passing through the furnace, as well as to protect and perfectly isolate one patient from another. At the request of the New York Quarantine Commission, I put the plans all in definite shape; they were very greatly pleased by the plans, but as the Act of Assembly under which they were working only provided for a crematory, that was all they could adopt, and that I had built for them on Swinburn island. In view of the fact that you are interested in the erection of a quarantine hospital below Philadelphia, my brother suggested that I send you the plans for inspection. The proposed plan would be much more expensive than an ordinary building, but when we consider the importance of complete isolation of patients, and the complete destruction of all poisonous germs, cost sinks into insignificance. The cost of the epidemics of yellow fever in the last five years would have put such a hospital at every important sea port on our exposed coast, and saved the many lives sacrificed. By this plan you can place a patient in one room with yellow fever, and in the next room one suspected of having small pox, and in the next room a patient with cholera, and the well person in the middle will be as safe as if fifty miles distant. Should there be any point which you do not fully understand, I shall be pleased to explain.

Yours very truly,
M. L. DAVIS.

(b.) DESCRIPTION AND PLAN OF FURNACE.

The hospital building consists of a central building and wings radiating from it of any desirable number and length. Fig. 1 represents the first floor of the central building. The rooms are intended to be used for offices, dining room, kitchen, waiting room, etc; all are marked G on the plan.

In the corridor an iron stairway marked S runs to the upper stories. Radiating from the central building are the wards for patients marked H. Each ward has a hallway in the centre running lengthwise, with row of rooms on either side marked F. Each room is provided with



two doors, an outside one opening into the hall, and an inside one opening into the room; between these doors is a vestibule marked E. This vestibule is provided with a vessel containing a disinfectant, and everything passing out of the room is here disinfected before getting into the hall. Both doors are provided with springs and gum packing, so as to make the room and vestibule air-tight.

Under each hallway is a large pipe marked by dotted lines a. This is the ventilating pipe, and runs to the cremation furnace marked X: its use is explained in fig. 2.

Fig. 2, a cross section of two rooms and hall showing ventilating system. F is the room, K is steam radiator, C is a trap packed with absorbent cotton with any desirable disinfectant, through which air is admitted to the room by suction through pipe B. E is the vestibule provided with a hall door and an inside door b. D is a pipe through which air is admitted to vestibule; g is the disinfectant vessel. A is a large pipe running under hall floor the entire length and delivers its contents under the grate bars of a cremating furnace. Strong suction is produced through this pipe by the furnace flues (108 ft.) and the stack. L is a branch pipe running from the vestibule, and B a similar one from each room; these pipes connect with main pipe A, and carry the impure air and poisons from the rooms and vestibules.

Fig. 3 is the second story of the main building.

Fig. 4 is the basement of main building showing location of the cremation furnace marked X. This furnace is so constructed that excreta, garbage, etc., as well as the bodies of the victims of infectious diseases, without odor or smoke, are cremated.

Fig. 5 is the trap through which air is admitted into the rooms. It is so arranged that it can be packed with any disinfectant.

Summary. The ideas involved are that the patient is placed in an air-tight room, no air being admitted except that which passes through a disinfecting trap. No air is allowed to escape from the sick room except through the furnace. All excreta, garbage, bodies, and everything that can retain poisonous germs, pass through the furnace and are thereby destroyed.

IV.—SMALL POX AT PITTSBURG.

July 13th, 1889.

Dr. Benj. Lee, Secretary State Board of Health.

DEAR SIR:—To-day a case of small pox was reported in Mercy hospital, and upon examination, I found it to be a malignant case, and sent it to the Municipal hospital. He lay in a hotel in Cannonsburgh for several days before coming here, and some fourteen days before he complained, he came from Bradford, where he must have taken it. I suggested to our health officer that he should notify Dr. Thompson, the

State Sanitary Inspector for this district, as it might be better for him to go to the hotel in Cannonsburgh and see that all with whom he may have came in contact be vaccinated; and in case any new cases arise, they be isolated at once. They report to me Dr. Thompson is with you at Johnstown to-day.

J. Guy McCANDLESS,
Pittsburgh Board of Health.

V.—SANITARY NEEDS OF CARBONDALE.

CARBONDALE, PA., *September, 24th*, 1899.

Benjamin Lee, M. D., Secretary State Board of Health.

DEAR SIR:—We the undersigned residents of the city of Carbondale, beg to call your attention to the utter disregard of sanitary laws which have been provided for the protection of people in this city. We are without a board of health, and the authorities decline to assume the duties which the health ordinance provides shall be performed by a sanitary officer, under the direction of a board of health.

Diphtheria prevails in many parts of the city to an alarming extent, the disease, too, of a malignant type. Typhoid fever is prevalent, and a number of deaths from this disease have occurred. Public funerals are held, and the bodies are carried to the churches before interment takes place. The attention of the authorities has been called to the violation of law in this particular, but no attempt to prohibit public funerals has been made.

We realize the danger to which our families are exposed, and appeal to you for assistance. Will you come to this city prepared to investigate?

D. L. BAILEY, M. D.
J. B. VAN BERGERY.
CHARLES LEE,
Pastor Presbyterian Church.
S. S. SHIELDS, M .D.
JAMES STATT,
Cashier of First National Bank.
H. C. WHEELER, M. D.
REV. W. HENRY PLATT.
REV. L. C. FLOYD.
JOHN J. FORBES,
Superintendent of City Schools.
D. L. DAVIS,
Pastor of Congregational Church.

VI.—FALSE CERTIFICATES OF DEATH.

(a.) COMPLAINT OF THE STATE BOARD OF HEALTH OF OHIO.

COLUMBUS, OHIO, *February* 14, 1889.

Dr. Benjamin Lee, Secretary State Board of Health.

DEAR SIR:- We have report of thirteen cases of scarlet fever at Fredericksburgh, O., traceable to a corpse shipped from Latrobe, Pa.

The following certificate accompanied this corpse.

LATROBE, *January 9th*, 1889.

To the Pennsylvania Railroad:

This is to certify that this child of Norman Woodruff died with inflamation of the lungs.

(Signed) S. C. CAMPBELL.

We would be greatly obliged for an investigation of this matter.

Yours truly,

C. O. PROBST, *Secretary.*

(b.) REPORT OF THE SPECIAL COMMITTEE.

The committee appointed to give a hearing to Drs. W. K. Van Kirk of McKeesport, and S. C. Campbell of Latrobe, on the charge of issuing false certificates for the transportation of bodies of persons dead of contagious diseases, beg leave, respectfully, to report that in the case of Dr. Van Kirk, the doctor has appeared personally before the committee, in response to the summons of the Board, that his defense is that the certificate was given in the absence of the physician who had attended the case, on the assurance of the mother of the child that it had died of a non-contagious disease, that there was no intention of deception on his part, and that he received no money or other compensation for giving the said certificate.

The committee recommend that Dr. Van Kirk be considered as not guilty of the charge of intentional infraction of the regulations of the Board, or deception, but that he be admonished in future to issue no certificates without definite information, either personal or derived from a fellow physician, of the nature of the case.

In the case of Dr. S. C. Campbell, that the doctor appeared personally before the committee in obedience to the summons of the Board, that his defense is that he was called to the patient, an infant of about one year of age, when it was within about eight hours of the fatal termination, that it was then suffering from capillary bronchitis, that there was no eruption on the surface, no throat complication, no desquamation, in short nothing to indicate that the disease was anything more than capillary bronchitis: that the attending physician who left the case in his hands, while absent, had informed him that the child had the scarlet fever some weeks previous, but had recovered when the pre-

sent illness came on: that he was informed that there were cases of typhoid fever in the house, but was not informed that there had been another case of scarlet fever in the house; and that he gave the certificate, for which he received no money or other compensation, believing the cause of death to be as stated in the same, inflammation of the lungs, and with no intent to deceive.

The committee would call attention to the fact that the parents and another child, who is said to have had scarlet fever, accompanied the corpse home to Fredericksburg, which leaves room for the supposition that they, or their effects, may have been the source of contagion, rather than the corpse.

The committee recommend that Dr. Campbell be considered as not guilty of the charge of intentional deception and fradulent issue, but that he be admonished of the necessity for in future acquainting himself of the entire previous history in any case he may be called upon to certify to as to cause of death, and that in such instance, it is not the immediate cause of death which is to be given, but the disease which produced the condition which was the immediate cause of death, since the former plan would always give opportunity for evasion of the law.

Respectfully submitted,

DAVID ENGELMAN,
BENJAMIN LEE,
Committee.

VII.—SMALL POX AT WILKES-BARRE.

WILKES-BARRE, PA., *May* 18, 1889.

Dr. Benj. Lee, Secretary.

DEAR SIR:—I am much pleased to be able to report that the suspected case in Kingston proved to be entirely innocent of small pox or varioloid, and the quarantine has been removed. I regret, however, to be compelled to report that that which we have feared might occur, has now come to pass, viz: the small pox has been introduced into Wilkes-Barre from Nanticoke.

The first case was seen by Dr. R. Davis, early on Thursday morning, May 16, and by him reported. Col. Sturdevant, chairman of the sanitary committee, at once placed a guard of two policemen at the house, and put out the flag. A meeting of the sanitary committee was held, and Dr. W. S. Stewart, police surgeon, placed in charge of the patients, with a trained nurse to attend him. The action of the sanitary committee was prompt, energetic and decided. The man affected had been ill a few days before the doctor was called, and the people who were known to have seen him, have since been vaccinated. Subsequent inquiries develope the fact that the patients father-in-law who lives with him, had been ill for about two weeks with a *rash*, which is now disap-

pearing, and had not called a physician to attend him. He had visited Nanticoke a week or two before his illness, but was not exposed to the disease so far as he can tell. He visited the mines during the course of his stay and also went into a beer saloon, returning to Wilkes-Barre late the same day. He was quite ill, being in bed about a week, but being poor, and not feeling alarmed on the subject of his illness, did not call a physician. His son-in-law, who has evidently taken the disease from him, does not know whether he has been successfully vaccinated or not.

The other inmates of the house are the patient's wife and three children. These have all been re-vaccinated. At a meeting of the sanitary committee, and representation of the poor board held yesterday, arrangements were made to cope with the disease promptly, the poor board assuming the responsibility of providing provisions and medicine, and the sanitary committee assuming all other expenses.

This evening I saw another case with Dr. Davis, in the same neighborhood. The patient was a man convalescent from an attack of pneumonia. He seemed at 7 p. m. to be in a dying condition. This has been reported, and a guard will be at once placed and all necessary precautions taken. I have written to the sanitary committee advising immediate vaccination of all school children, especially those in that part of the city. I think a letter from you to the sanitary committee, Col. S. H. Sturdevant, chairman, supplementing my recommendations in regard to vaccination might be advisable.

It is to be feared that other cases will appear from exposure to the first, *i. e.* from the one that did not have medical attendance.

All cases will be at once cared for and every effort made to prevent the spread of the disease.

Respectfully,

LEWIS H. TAYLOR.

VIII.—SMALL POX AT KINGSTON, LUZERNE COUNTY.

WILKES-BARRE, PA., *November* 26, 1888.

Dr. Benjamin Lee, Secretary.

DEAR SIR:—Upon receipt of your telegram ordering me to verify the report of small pox in the borough of Kingston, I visited Kingston this afternoon, and learn from the attending physician, Dr. Cross, that there is one case of genuine small pox, though of the modified form, in the borough. The patient is a young man traveling as news agent on the railroad, and he presumably was exposed to the contagion near Buffalo, N. Y.

The eruption was out several days before Dr. Cross saw the patient, but as soon as the disease was diagnosed, all proper precautions to prevent its spread were taken. Four others in the family have been ex-

posed and were promptly vaccinated. Four boarders were in the family also; two of them left immediately, and it is not known where they now are; two others had not been in the house for two days previous to the diagnosis, and were allowed to remain at another boarding house whither they had gone. Vaccination has already been quite generally performed in the borough.

The family in which the patient lives is an intelligent one, and will readily second all efforts to prevent the disease spreading. Inasmuch as the Kingston borough council has already adopted stringent regulations in regard to small pox, and as they seem abundantly able to cope with the matter themselves, it did not seem necessary to place additional guards in the name of the State Board. Dr. Cross has promised to notify me at once if other cases appear.

Very truly,

LEWIS H. TAYLOR.

IX.—SMALL POX AT NANTICOKE, LUZERNE COUNTY.

WILKES-BARRE, PA., *January* 7, 1889

Dr. Benj. Lee, Secretary.

DEAR SIR:—Acting upon instructions received from you on Saturday evening, I to-day visited Nanticoke to investigate rumors of small pox. Small pox was first reported to the borough council about December 23, 1888, whereupon Dr. S. Holly was requested by the council to investigate the alleged cases, and report the same to that body.

There were two cases; one a child of two years of age, and another aged twelve, neither of which had been vaccinated so far as known. The patients were at once isolated and a guard stationed at the house, allowing no outsiders to enter. A pest house was at once built, at a suitable distance from the centre of the town, the patients removed to it and Dr. Dan. Evans placed in charge. The bedding on which the children were sleeping, together with the effects of the room, was burned and the house cleansed and disinfected.

The youngest child died January 1, 1889; the other is improving. No new cases have been developed, and if such should appear, the borough council is amply able to cope with the disease. The prompt and appropriate measures taken by the council have, no doubt, prevented a spread of the disease. These patients were in a family of German Polanders, and is it not known positively whence the contagion came, but it is supposed to have been brought by some emigrant recently from shipboard, as Polanders in this especial part of Nanticoke are constantly entertaining new arrivals of their counrymen, some of whom remain but a short time, and then pass on to other localtities.

Respectfully,

LEWIS H. TAYLOR.

X.—SMALL POX AT GLEN LYON, LUZERNE COUNTY.

WILKES BARRE, PA., *July* 23, 1889.

Dr. Benj. Lee, Secretary.

DEAR SIR:—I have been delayed in sending you the results of my investigation of the Glen Lyon small pox case, partly by my absence from town when your letter came, and partly by the difficulty in getting at the facts of the case. There had been one case of small pox in Glen Lyon, previously reported, in April, but especial care was taken of it by the township authorities, and the disease did not spread. The present case, Wm. D., aged 22, vaccinated, was taken ill July 2, 1889. The local officials of the Susquehanna Coal Company immediately built a pest house, a mile and a quarter distant from any dwelling, and the patient was at once moved to it. He was discharged July 22. He refused to give any information about himself as to the manner of contracting the disease, but Dr. Dan. Evans ascertained from others in the family that the patient had gone down the river, July 22, below Shickshinny, to meet a canal boat. On board the boat he met a girl with whom he had been keeping company, whom he found had just recovered from small pox. He remained on board the boat until June 30, returned to Glen Lyon, and was beginning to break out July 2. In the boarding house to which he returned there were twenty in number, including family and boarders. Some had had small pox, and all were vaccinated. None of these took the disease, but the patient was not allowed to remain after his disease was known, but he was literally thrust out, and a pest house built for him in a few hours.

There are no other cases known in Glen Lyon or Nanticoke. It is possible, and quite probable, that among the Poles and Hungarians, there may have been cases unreported to the authorities.

Respectfully yours,

LEWIS H. TAYLOR.

XI.—TYPHOID FEVER AT NANTICOKE.

WILKES-BARRE, PA., *August* 20, 1889.

Dr. Benj. Lee, Secretary.

DEAR SIR:—At request of Dr. S. F. Holly, I to-day visited Nanticoke to make inquiry into certain reported cases of typhoid fever in that borough. In the extreme northern end of the borough, near the limits, is a farm owned by the Lehigh and Wilkes-Barre Coal Company, known as the Hake's place, and occupied by a Mr. M. and family. Another family lives very close by, and uses the same well for drinking water.

The first taken sick about June 27, was Lewis H., aged 16, recovered. Following these cases came Mrs. M., aged 58, taken sick July 4. slowly

recovering. Michael DeH., aged 24, taken sick July 25, recovering. Mrs. W., aged 35, taken sick latter part of July, improving. May W., aged 9, taken sick August 6, improving. — — — — — , living in Tunkhannock, had been working on the place, is now reported ill with typhoid fever There are four others in the family who have not been ill this year, viz: Mr. M and three daughters. Mr. M. and one daughter had the disease last year: the other two have escaped. There is no typhoid anywhere in the neighborhood except at these two houses. The two families use water from a common well, which none of the other neighbors use. Suspicion would naturally point to this well as the cause. We can see no reason for contamination, excepting in the fact that this well is on a sloping bank, while 75 feet above it, and in direct line, is an old abandoned cess pool, not used for 10 or 12 years. It is possible that the heavy rains of June may have liquified the contents of this vault and allowed percolation to take place. I have arranged to send a sample of the water to Dr. Cresson for analysis, and if it proves to be contaminated, the well ought to be abandoned and a new one dug, for if any percolation has taken place from the old vault, we cannot tell but what the ground between it and the well is still saturated.

Respectfully yours,

LEWIS H. TAYLOR.

XII.—DIPHTHERIA AT GALITZIN, CAMBRIA COUNTY.

ALTOONA, PENNA., *October 9th*, 1889.

Dr. Benjamin Lee, Secretary State Board of Health.

DEAR SIR:—An epidemic of diphtheria of quite extreme severity, has again broken out at Gallitzin. There were seven deaths of children, during the 24 hours ending last night, and there are some 30 or 40 cases now in the borough.

On the invitation of the borough authorities, I went to Gallitzin yesterday evening, and addressed a so called mass meeting of the citizens, called for the purpose. There were perhaps 60 to 100 people present, and careful attention was paid to what was stated. I tried to explain how diphtheria is disseminated, and what precautions are necessary to prevent its spread, taking my cue from the circular of the State Board of Health on "Diphtheria."

As in many such communities, there seemed to be a disposition to look for outside help to enable them to meet the difficulty, and they were quite anxious to know if the State Board of Health would not do something. I tried to impress upon them that so long as they themselves were the parties afflicted, and were not a terror to contiguous neighborhoods, they would have to deal with the problem themselves.

The real difficulty in this case is lack of water supply, the people

being entirely dependent on shallow wells, lack of sewerage system, the house filth and excrement being simply put in holes in the ground, and draining into the wells below, and a complete lack of the ordinary precautions that are now used to prevent the spread of diphtheria, as shewn by public funerals, non-isolation of cases, and far too great lack of disinfection of the excreta.

There is also lack of efficiency on the part of the borough authorities in enforcing necessary rules in regard to cleanliness.

We have promised to help these people get started toward an organization, either through a committee of councils, or a board of health, which will do something toward taking the necessary precautions against the spread of epidemics. For this purpose, won't you kindly have sent me, at your early convenience, at least 100 circulars on "Diphtheria," 5 copies of the "Model Ordinance," and 3 copies of the "Compendium of the Law of the State in regard to Boards of Health." As soon as these are received, I will arrange to go to Gallitzin, and spend time enough to get these people started, at least, in the line of more correct work. Kindly let me know if you approve of this arrangement, and if you would suggest any different action.

Very truly yours,

CHAS. B. DUDLEY,

Medical Inspector.

P. S.—The schools were closed yesterday until the 1st. of December

XIII.—QUARANTINE AT CAPE HENLOPEN.

(a.) APPOINTMENT OF DR. BENJAMIN LEE AS U. S. COMMISSIONER.

WASHINGTON, *May* 9, 1889.

Doctor Benjamin Lee, Secretary of Board of Health of Pennsylvania.

SIR:—By request of the supervising surgeon-general, and in accordance with the terms of the Act of the Delaware legislature ceding the jurisdiction to the United States of a portion of land at the Delaware Breakwater for quarantine purposes, you are hereby designated and requested to act as a commissioner in conjunction with three commissioners to be appointed by the state of Delaware to fix and determine the boundaries of the said land.

Your travel expenses will be paid, and compensation for the actual time engaged at the rate of $10.00 per diem.

Should you accept this designation, you will please reply at once to the supervising surgeon-general, when the Governor of Delaware will be notified, and the commissioners can set a day for their meeting.

Respectfully yours,

GEO. S. BATCHELLEY,

Acting Secretary.

(b.) COPY OF AN ACT TO CEDE CERTAIN LANDS TO THE UNITED STATES OF AMERICA.

Be it enacted by the Senate and House of Representatives of the State of Delaware in General Assembly met:—

Section 1. That Hiram R. Burton, David L. Mustard and Franklin C. Maull, of Sussex county, be, and they are hereby appointed commissioners on the part of the state of Delaware, and they, or a majority of them, are hereby authorized and empowered in conjunction with any agent or person appointed by the President of the United States, or by the Secretary of the Treasury, to locate and fix the boundaries of any quantity of land belonging to the state of Delaware, not exceeding fifteen hundred feet front, and twelve hundred feet deep from low water mark, situate and lying on the Delaware Bay between the United States Government Iron Pier, and the point of Cape Henlopen, and the land so located and designated by the aforesaid commissioners, in conjunction with the agent or person appointed as aforesaid by the President of the United States, or the Secretary of the Treasury, and all claim, title, and right of soil and jurisdiction of the state of Delaware, in, to, or over the same, are hereby ceded to, and vested in the United States in perpetuity: that a plot of the land so located and hereby ceded as aforesaid, be made and recorded in the office of the recorder of deeds, in and for Sussex county:

Provided, that the sovereignty and jurisdiction of this state shall extend over the land hereby ceded to the United States, so far, as that all civil and criminal process issued under any law of this state may be executed in any part of said lands, and the buildings or structures thereon erected.

Section 2. That the above cession of land and jurisdiction is made upon the express condition that a quarantine station shall be located and maintained thereon by the United States.

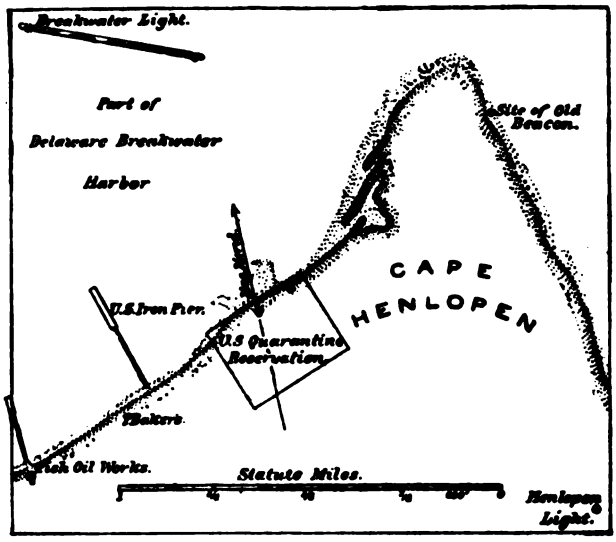
(c.) NOTIFICATION FROM J. F. SAULSBURY, ESQ., SECRETARY OF STATE OF DELAWARE.

DOVER, DEL., *May* 21, 1889.

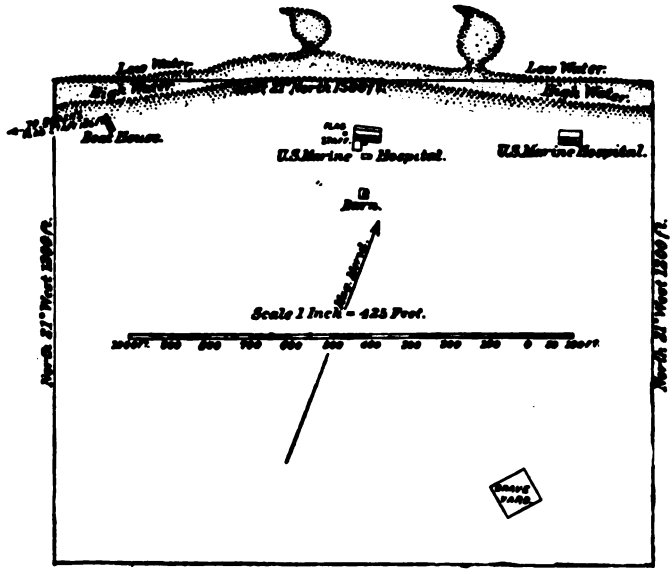
Doctor Benjamin Lee.

DEAR SIR:—The Secretary of the Treasury of the United States has informed me that he has appointed you commissioner on the part of the United States to condemn certain land at, or near Lewes, for quarantine purposes.

The commissioners on the part of the state of Delaware are Hiram R. Burton, David L. Mustard and Franklin C. Maull. Any



QUARANTINE STATION AND VICINITY.



The above is a draught of the lands ceded by the State of Delaware to the United States for a quarantine station, by an act of assembly passed at Dover, April 12, A. D. 1889, and surveyed and located pursuant to the provisions thereof by A. M. on the 28th and 29th of May, 1889.

HIRAM R. BURTON,
DAVID L. MUSTARD,
FRANKLIN C. MAULL,
Commissioners.

BENJ'N LEE,
Agent for the United States.



tion addressed to either of these gentlemen will receive prompt attention. Their address is Lewes, Delaware.

Respectfully

JOHN F. SAULSBURY,

Secretary of State for Delaware.

(d.) REPORT OF DR. BENJAMIN LEE, SECRETARY, AS COMMISSIONER FOR THE UNITED STATES, TO FIX THE BOUNDARIES OF A QUARANTINE STATION NEAR THE DELAWARE BREAKWATER, AT THE MOUTH OF DELAWARE BAY.

On the eleventh day of May, 1889, I received a communication from Surgeon-General, John B. Hamilton, of the United States Marine Hospital Service, conveying my appointment, by the Secretary of the Treasury of the United States, as commissioner on behalf of the United States Government, to meet three commissioners appointed by the state of Delaware, to fix the limits of land to be ceded by the state of Delaware to the United States Government for quarantine purposes, on Cape Henlopen, at the mouth of the Delaware Bay, near the town of Lewes, and within the Delaware Breakwater. Considering the permanent establishment of a well equipped quarantine station at this point, a matter of the greatest importance to the city of Philadelphia, and hence, to the entire state, I felt justified in requesting the President of the Board, Dr. David Engelman, to accompany me, which he kindly consented to do.

We reached Lewes on Friday, May 24th, at noon, and were courteously received by Dr. William P. Orr, Surgeon of the United States Marine Hospital Service, on duty at the station, and by him introduced to Dr. Hiram R. Burton, Dr. David L. Mustard, and Mr. Franklin C. Maull, all of Lewes, Sussex county, Delaware, the commissioners appointed by the state of Delaware.

The location of the hospital was noted, the shore line carefully followed and the land back of the hospital gone over.

After some discussion, a point was determined on, which should mark the north-westerly corner of the grounds, and from this as a fixed point, the lines were drawn which should constitute their boundaries. The following is the description of them as given to the surveyor.

Beginning at a point at low water mark opposite a point one hundred and twenty feet from the north west corner of the boat house of the United States Marine Hospital on an imaginary line drawn from said corner to the flagstaff on Baker's house. Thence in an easterly direction 1500 feet to a point at low water mark below the lower hospital building, for the front of the reservation. Thence 1200 feet at right angles with said shore line in a southerly direction. For the eastern and western limits of the reservation, right lines 1200 feet long drawn perpendicular to the front line at its extreme eastern and western points.

The southern boundary shall be a line joining the extreme points of the eastern and western boundaries and 1500 feet in height.

Appended are a plan of the station as decided above, and correspondence.

Respectfully submitted,

BENJAMIN LEE,
Commissioner for the United States.

XIV.—EXTRACTS FROM MEMORANDA MADE BY DR. CHAS. M. CRESSON RELATIVE TO WATER SUPPLY AND DISEASE IN THE CITY OF PHILADELPHIA.

The present communication refers to the relation of Water Supply to Typhoid Fever only.

The ratio of deaths from typhoid fever in Philadelphia in each million of inhabitants for the year 1888 was for that part of the city chiefly supplied from the Delaware river:

Lardner's Point,	763 deaths.
Kensington (Otis street),	1,190 deaths.
Spring Garden works, direct pumpage from the street mains,	706 deaths.
Best ratio was from a district supplied from the Schuylkill by means of reservoirs,	607 deaths.

During the first three month of the year 1889, the district known as Kensington was largely supplied with water from the Schuylkill river, and the death rate of that district was below 700 in the million, in the place of 1190, which was the rate for the year 1888 when Delaware water was supplied

The quality of water sent into parts of this district has been exceedingly variable, and the variations are principally due to the irregular injection of water into the mains from the Delaware river, either in fractional part or in whole. Upon one day in April last, water drawn from a hydrant in the 19th ward gave .137 parts of albumenoid ammonia in the morning, .192 parts at noon and .247 parts at night.

The analyses of the samples of water were made after they had been set aside 12 hours or more to allow of the "settlement" of the suspended material, but the samples were not filtered and were examined in the condition in which they were used by a majority of the consumers of water.

Since the first of February the water in the Delaware river has been in an unusually foul condition, not only opposite, but above and below the city of Philadelphia; in fact, the quality of the water of that river has been continuously bad and unfit for use. Early in last January I discovered in the water of the Schuylkill river, in the Flat Rock dam, organisms which corresponded in description with those found in the

evacuations of patients suffering from typhoid fever. The presence of this material was traced as far up the river as Norristown, which is situated about 8 miles above the Flat Rock dam. These organisms were soon afterwards discovered in the water pumped direct from the Schuylkill river, and finally in that supplied from all of the basins excepting those of the Fairmount works. Within a few days after this discovery, the reports to the board of health showed a great increase in the number of *cases* of typhoid fever; soon afterwards the number of *deaths* recorded from typhoid fever was also greatly increased.

The following tables show the weekly returns:

1889.	CASES.	DEATHS.
January 5,	58	10
January 12,	58	10
January 19,	118	8
January 26,	192	10
February 2,	129	25
February 9,	82	18
February 16,	108	21
February 24,	96	18
March 2,	143	18
March 9,	80	21
March 16,	79	8
March 23,	60	14
March 30,	47	18
April 6,	74	7
April 13,	58	11
April 20,	67	8
April 27,	50	15
May 4,	48	10
May 11,	63	9
May 18,	72	17
May 25,	78	15

At the commencement and during the continuance of this epidemic of typhoid fever, the quality of the water as determined by chemical tests was occasionally good, but generally in doubtful, and frequently in very bad condition.

The chemical test of the quality of water chiefly determines the presence of decaying animal matter, and shows whether or not the organic matter is derived from cesspools.

It is not believed that the impurities in the water *generate* cholera and typhoid fever, but that the presence of decaying material causes the water to take an alkaline condition, a condition necessary for the preservation of the life of the organisms which carry those diseases. The decaying material, however, promotes the occurrence of other diarrhœal diseases, the nature of which other diseases will be discussed at a future time.

When it is evident that the source of pollution is from cesspool drainage, then there is a liability at any time of the production of an epidemic of cholera or typhoid fever, by the introduction into the water supply of the dejecta of patients suffering with these diseases; such

was the cause of the epidemic of typhoid fever which commenced in January last, to wit: the introduction of the dejecta of typhoid fever patients into the Schuylkill river at Norristown.

I have seldom failed to find evidence of the presence of typhoid dejecta in the water of the Delaware river; mechanical concentration of the sedimentary material of a considerable bulk of water being an essential to the success of the examination.

In the consideration of the effect of water supply upon health, there are three distinct lines of investigation to be followed:—

First, As to the presence and the amount of decaying and decayable matter carried by the water.

Second, As to the organisms present which carry zymotic diseases.

Third, As to the presence of substances or organisms which produce diseases by mechanical violence.

The first of these investigations is made by chemical means.

The second and third by the microscope and by the methods of biological inquiry.

Daily examinations have been made of the quality of the water supplied to parts of the city for the past eighteen months and samples have been preserved, and of these there is not one which shows absolute freedom from sedimentary matter, and some of them are so foul that a stratum of water two inches in thickness completely prevents the transmission of light. The quality of the samples at times has been fair, but more frequently doubtful or unfit for use.

It has recently been stated that no systematic examinations of the water supply have been made. This statement is not correct. During the past seventeen years periodical examinations have been made of the water supply and reports upon its condition, under resolutions of the commissioners of Fairmount park. The first object to be attained by these analyses was the discovery and location of the sources of pol lution; and the results of analysis determined, in very many instances, the action of the park commissioners in the removal of the local causes of pollution.

The park commissioners require analyses to be made of the water in the several forebays or inlets to the pumping stations, and the results of this work are recorded in books which are kept at the offices of the park commission, water department and health office.

For several years analyses have been frequently made of the water supplied to various locations in the city, and for many months this has been a daily practice. The records of the analyses of the water supplied by hydrant in the several districts of the city are kept in my own possession, having been entirely at my own cost, but they have been freely used for public information from time to time. To increase the value of the records of analyses, and to enable ready estimation of the quality of the water upon the health of the consumers I have had care-

ful count made of the dwelling houses erected and of those abandoned, (and for each ward separately during the years 1874 to 1889) for the purpose of ascertaining correctly the population of each district of water supply from time to time, and I have made tabulated statements from time to time, from the records of the board of health for the years 1861 to 1889.

The water supply to Philadelphia is now, and has been for years past, derived partly from the Schuylkill and partly from the Delaware river opposite to or near the city. A portion of the Schuylkill supply has been pumped into reservoirs and from them distributed, but another portion has been pumped directly from the river into the street mains for distribution, without an opportunity for the separation of large per centages of floating or suspended matter by the operation of "settling." A third portion of the water supply has been taken from the Delaware river, into which the chief part of the sewage and drainage from the city of Philadelphia and that of Camden is freely run.

The operations of settling and filtration have each and both advantages over the use of the water direct from the river. But the definite consideration of the benefits to be derived by either or both treatments, cannot now be detailed

Information derived from the health authorties of other cities, as to the ratio of deaths to population in the year 1888 from typhoid fever, shows the following results:

Deaths in the Million of Inhabitants.

Pittsburgh,	868	Milwaukee,	348
Memphis,	810	Baltimore,	322
Philadelphia,	766	Newport,	318
District of Columbia,	671	St. Louis,	295
Indianapolis,	666	Worcester,	270
Louisville,	665	Lynn,	260
Fall River,	661	Taunton,	250
Cincinnati,	624	Pawtucket,	240
New Haven,	500	New York,	235
Hartford,	490	Brooklyn,	188
Cleveland,	480	New Orleans,	188
Chicago,	451	Atlanta,	161
Rochester,	450	Philadelphia, worst district,	1190
Boston,	409	Philadelphia, best district,	607
Peoria,	365	London, England (1887),	471

If it were possible to dispense altogether with the use of water from the Delaware river opposite or near to the city of Philadelphia, and substitute that pumped from the Schuylkill river into the basins and properly settled, the death rate could be greatly reduced. But if it were possible by a change in source of water supply, to reduce the death rate for typhoid fever in Philadelphia to that of London, England, more than 550 lives could be saved annually.

If the death rate from typhoid fever in Philadelphia for the year 1888, could have been reduced to that of New York City, not less than 500 lives would have been saved, and this result could have been effected by the expenditure of far less capital than was recently expended by New York City for the purpose of improving a water supply already in better condition than that of Philadelphia.

Evedence of the great advantage to be derived from the substitution of an occasionally fair water supply for one that is continuously bad, is shown by the record of cases and deaths from typhoid fever in one of the north-eastern wards in Philadelphia.

The cases and deaths reported in successive weeks from January 5, 1889, were as follows:

Cases,	0,	3,	5,	3,	1,	0,	4,	6,	7,	0,	
Deaths,	0,	0,	1,	0,	2,	0,	0,	0,	1,	1,	
Cases,	2,	5,	2,	1,	3,	8,	6,	2,	10,	4,	19—(91)
Deaths,	0,	0,	0,	0,	1,	2,	1,	1,	1,	2,	0—(13)

The injection of Delaware water during six weeks has given a continuous record upon the death roll.

In another ward supplied from the Delaware river the record shows as follows:

Cases,	3,	9,	2,	6,	3,	3,	10,	11,	11,	10,	
Deaths,	1,	3,	0,	0,	0,	0,	2,	0,	3,	2,	
Cases,	7,	4,	4,	9,	8,	11,	4,	6,	3,	5,	2—(131)
Deaths,	3,	3,	1,	1,	2,	2,	4,	4,	1,	1,	3—(36)

In the first instance the water supplied was chiefly from the Schuylkill river, until within the last eight weeks, when it was mixed with that of the Delaware river in varying proportions.

In the second instance the water was from the Delaware river, and the average death rate since the first of January last was twenty-seven hundred (2700) deaths to the million of population.

The death rate in one district supplied for the same period from the Schuylkill river was less than five hundred (500) to the million.

It is therefore evident that the water of the Delaware river opposite to the city of Philadelphia (even when taken at Lardner's Point) is never free from organisms capable of communicating zymotic disease.

It is also evident that the water of the Schuylkill river carries a smaller amount of the same organisms, which are liable to be increased in amount periodically. (Except that since January, 1889, the water at Flat Rock dam has been almost continuously charged with organisms derived from patients suffering from zymotic diseases at Norristown, Conshohocken, etc.)

The Delaware river receives the household drainage from about 700,000 individuals, and the Schuylkill river above the Fairmount dam, receives that from not less than 200,000 individuals.

Taken altogether the records of the health board show a very decided

advantage in favor of the complete substitution of the water of the Schuylkill river for that from the Delaware.

The fatal results of the epidemic of typhoid fever commencing in January last, in the districts supplied from both rivers, show the absolute necessity for the selection and adoption of a new source for water supply as soon as possible.

There is no doubt that a great improvement in the quality of the water from the Schuylkill river can be made by settling and by filtration, but it will presently be shown that there are other and equally serious objections to its use even when filtered, for filtration will not certainly remove the organisms which produce typhoid fever and other zymotic diseases, and further more, filtration of the water from the Schuylkill river is not a practicable operation continuously.

CHARLES M. CRESSON, M. D.

The damaging effect of substituting a water supply which uninterruptedly carries the material which produces typhoid fever, for one that carries it interruptedly and occasionally, is shown in the records of deaths from typhoid fever in the Sixteenth, Seventeenth, Eighteenth, and Nineteenth wards of this city.

The water of the Delaware river opposite to and for some distance above the city of Philadelphia is never free from the dejecta of typhoid patients, whilst that of the Schuylkill, either when the river has been thoroughly swept out by a strong freshet, or has been quietly flowing at its normal slow rate of two to three miles a day, is comparatively free from the material referred to; this freedom however, is disturbed to a greater or less degree by the greater or less flow caused by rain-storms which transfer sedimentary matters from the upper to the lower ends of the pools of the dams, or the contents of one pool into another.

During the year 1888, the four wards referred to were supplied with water from the Delaware river, and the annual death rate in each million of inhabitants from typhoid fever was 1362.

During the first three months of the year 1889, the water was supplied from the Schuylkill river and the annual death rate was 342.

During the eleven weeks from April 1st to June 15th, the water supplied was a mixture of that from both the Schuylkill and the Delaware rivers, and the annual death rate was 957.

From this it appears that the substitution of water from the Schuylkill river was followed by a decided fall in the death rate from typhoid fever, and that the injection into the water supply from the Schuylkill, of a proportion of water from the Delaware river, has added materially to the death rate of the district so supplied. The substitution of a mixture of the waters of both rivers for that of the Schuylkill *alone, has been extended to other sections of the city and with similar results* as to the production of disease.

Daily analyses have been made of the waters supplied to several districts of the city in order to ascertain from what sources they were obtained.

Some idea can be had of the proportions of water supplied from each river from the results of daily analyses made of water drawn from a hydrant in one of the four wards referred to.

The following is from the record of analysis for succeeding days in the month of May—⅛ Delaware, ½ Delaware, ½ Delaware, ⅛ Delaware, ½ Delaware, All Schuylkill, All Schuylkill, ¼ Delaware, ½ Delaware, ¼ Delaware, etc. In another one of the four wards the supply was occasionally all Delaware water, but was generally from the Schuylkill river with varying fractional parts, such as ⅛, ¼, ⅛, ½, ¾, etc., from the Delaware.

When we consider that the most objectionable material in sewage is solid and insoluble in water, and that dilution with water does not destroy, or even lessen, its destructive agency, but simply spreads it throughout a larger amount of vehicle, then it is evident that the policy of mixing a badly contaminated water with one of better quality is calculated to promote the spread of an epidemic.

In one of the reports of the commissioners appointed to inquire into the best means of preventing the pollution of rivers in Great Britain, is an account of the results of the substitution of a bad water supply for a fair one. A severe outbreak of typhoid fever occurred in Guilford, within an area which nearly coincided with a particular section of the public water supply. It was shown that about ten days before the outbreak 330 out of 1675 houses had *exceptionally* received their water from a service reservoir which had been filled from a new well sunk in the lowest part of the town and close to several sewers, the brick work of which was so defective as to allow the sewage to flow into the well. "*The persons residing in or frequenting these* 330 *houses constituted the part of the population on which the epidemic influence had almost exclusively fallen.*" The water from the new well had been pumped on or before August 1st, and had been stored in a reservoir until August 17th, when it was distributed. "It was distributed on no other day and to no other houses." "These 330 houses, therefore, on which the fever almost exclusively fell had received a different water from the other houses of the town, viz:—water from the new well, stored up from August 1st, and delivered on August 17th." Great numbers of similar cases of the poisoning of communities by the contamination of a water supply with the discharges from the stomachs and bowels of cholera and typhoid patients are given by the same authority.

The water from the Delaware river, which daily receives the evacuations of probably 700,000 individuals, that is over 1,000,000 pounds of excremental matter, constantly gives evidence of its presence. The soluble matter, after vibrating up and down the stream with the changes

of tide, is finally carried *down* the river to the ocean, whilst the solid insoluble fecal matter which carries the dangerous element, and is slightly heavier than water, is transported *up stream* and a little further by each flood tide, and is meanwhile deposited between the times of transport, upon the bottom and banks of the river, until its substance is finally converted into soluble matter, and thus carried off by the flowing waters of the stream, or into gases which escape through the air.

It is this peculiar action and effect of the flood tide which daily carries more and more fecal matter up the Delaware, that produces the continual and increasing depreciation of quality evident in the water pumped from the river at Lardner's Point.

For some, as yet undetermined reason, the water pumped from the river at Lardner's Point has recently been enormously depreciated, so as to develop results far exceeding in degree the normal increase of the past eight years. The annual death rate in the million inhabitants from typhoid fever in the districts supplied with water from this location has been, for,

1880,	575
1883,	689
1886,	792
1889, (January to June,)	1,389

The marine works placed in the Delaware river for the purpose of changing the direction of the current, have probably contributed to the deposition of sewage solids in greater quantity than heretofore in the locality of the inlet to the Lardner's point pumping station, whereby the water when taken for city use has been contaminated to a greater degree.

The fact that in tidal rivers solid matters slightly heavier than water, are carried up stream and there deposited, was fully investigated in England by a commission appointed to report in relation to the proper location for the outfalls from the new London sewage system. This report states "It appears that at whatever point of a tidal river sewage may be discharged, the solid matters will again work their way up the stream, and deposit on the banks for speedy decomposition."

This is simply due to the greater power of the rising (flood) tide water over the ebb, in conveying deposits of but little specific gravity

This state of facts explains why towns upon the river Delaware which take their water supply from the river below this city, are less affected by typhoid fever, from the city sewage, than are the inhabitants of the city itself, who obtain their water supply from the same river a few miles *above* the sewage outlets.

The condition of the transfer of sewage in rivers which have *no tidal current*, and in those of *interrupted or intermittent current*, like the Schuylkill river, are very different from those of the transfer in tidal rivers.

The effect of water supply upon other diseases than typhoid fever, and the general health rate of many cities *from all causes*, have been investigated.

It has frequently been asserted that the record of general health of cities, places Philadelphia in the first rank for healthfulness of the larger cities, excepting only London, England.

This statement is not correct, for careful comparison of the death-rates of over 50 cities shows that the general death rate of Philadelphia from all diseases is far greater than that of many other large cities upon this continent and elsewhere.

Whatever superiority the relative standing of Philadelphia for healthfulness in comparison with other cities may have been years ago, it has now been lost by the failure of the municipality to provide for sanitary improvements in proportion to the rapid increase of population.

Other cities have taken the lead in the adoption of measures calculated to improve the health of their inhabitants, and in most instances decidedly improved results have been secured by the prompt, energetic, and efficient action of the authorities in the improvement of the quality of the public water supply.

CHARLES M. CRESSON, M. D.

XV.—NOTE FROM THE SUPERVISING SURGEON GENERAL U. S. M. HOSPITAL SERVICE, RELATIVE TO THE USE OF THE STEAMER AT QUARANTINE.

WASHINGTON, *July* 27, 1889.

Doctor Benjamin Lee, Secretary State Board of Health, Philadelphia, Pa.

SIR:—I beg leave to inform you that on account of the small appropriation granted by the last congress for the running expenses of the National quarantine station, it will be necessary, after the 31st instant, to discontinue the use of the quarantine steamer, "Florence," at the Delaware Breakwater station. You are respectfully requested to direct the pilots to bring all vessels to a point near the United States quarantine where they may be boarded by means of a small boat. While the running expenses of this station are necessarily diminished, it is still available as a refuge station where any infected vessel may be sent, and be fumigated by the acting assistant surgeon in charge. Cases of contagious diseases will also be received into the quarantine hospital as heretofore.

Respectfully yours,

JOHN B. HAMILTON,

Supervising Surgeon General, M. H. S.

XVI.—AN ACT TO PREVENT THE SPREAD OF CONTAGIOUS DISEASES AMONG DOMESTIC ANIMALS IN THE COMMONWEALTH OF PENNSYLVANIA.

Section 1. *Be it enacted, etc.*, That when it shall be brought to the notice of the Secretary of the State Board of Agriculture that any contagious disease, not otherwise provided for by law, prevails among domestic animals, he may take such measures to prevent its spread as may be deemed expedient, and for this purpose shall have power to place infected animals, herds, buildings and farms in quarantine, and to prevent the movement of animals or objects likely to convey the contagion, except upon proper permits, and, with the consent and approval of the Governor, to make such rules and regulations for the government of such quarantine as may be deemed necessary to effectively carry out the purposes of this act.

Section 2. That any person or persons who shall wilfully or intentionally interfere with any officer or officers, duly authorized to carry out the provisions of this act, or who shall wilfully or intentionally violate the provisions of the quarantine authorized by section one of this act, shall be deemed guilty of a misdemeanor, and upon conviction, shall be liable to an imprisonment not exceeding three months, or a fine not exceeding one hundred dollars, or both, at the discretion of the court.

Section 3. That when it shall be necessary or expedient to kill any animal or animals to prevent the spread of contagious disease, it, or they shall first be appraised by sworn appraisers who shall have due consideration for the actual condition of the animal or animals, at the time of appraisement, and the owner or owners shall be entitled to receive from the Secretary of the State Board of Agriculture, a certificate of value, which may be paid from current appropriations or by a subsequent appropriation by the legislature: *Provided*, That the amount of such certificates, issued in any one year, shall not exceed the sum of twenty-five hundred dollars.

Section 4. That for the economical eradication of contagious disease of domestic animals, the Secretary of the State Board of Agriculture shall have power, with the consent and approval of the Governor, to arrange for and carry into effect, terms of co-operation with the proper officers of the National Government.

Section 5. That all acts or parts of acts inconsistent herewith are hereby repealed.

Approved the 9th day of May, A. D. 1889.

APPENDIX G.

REPORT OF THE STATE PHARMACEUTICAL EXAMINING BOARD.

LANCASTER, PA., *September* 10th, 1889.

To His Excellency James A. Beaver, Governor.

SIR:—In compliance with the provisions of section four of the "Act to regulate the Practice of Pharmacy and sale of Poisons, and to prevent Adulterations in Drugs and Medicinal Preparations in the State of Pennsylvania," approved May 24th, 1887, I have the honor to transmit the second annual report of the board, for the year ending June 30th, 1889.

H. B. COCHRAN, *Secretary.*

Members of the Board.

Alonzo Robbins, President, Philadelphia. Frederick H. Eggers, Treasurer, Allegheny city. Harry B. Cochran, Secretary, Lancaster. Adolph J. Tafel, Philadelphia. Andrew B. Burns, Montrose.

REPORT.

The board has held four meetings during the year ending June 30th, 1889.

The first session of the first meeting was held in a public school house at Williamsport on Tuesday July 10th, and the second session was held in the Grand Army hall at Erie, on Thursday July 12th, 1888.

Thirty-four applicants appeared for examination, of which number twenty were successful.

The first session of the second meeting was held in the Central high school at Philadelphia, on Monday October 8th, and the second session in the College of Pharmacy at Pittsburgh, on Tuesday October 9th, 1888. Seventy-three applicants for examination presented themselves, of which number thirty-three were successful.

The third meeting was held in the Central high school at Philadelphia, on Tuesday January 8th, 1889. Eighty-three applicants for examination presented themselves, of which number forty-six were successful.

The fourth meeting of the year was held in the Lackawanna valley hotel at Scranton, on Tuesday April 9th, 1889. Fifty-two candidates for examination appeared, of which number twenty-nine were successful.

The number of persons examined during the year was two hundred and forty-two, number passed, one hundred and twenty-eight. The total number of persons registered during the year, by examination, under the last clause of section seven, and under the provisions of section eleven, was four hundred and sixty-one, which, added to five thousand, one hundred, and forty-six, registered during the first year, makes a grand total of five thousand, six hundred, and seven pharmacists registered in Pennsylvania, up to June 30th, 1889. Of this number, twelve hundred and eighty, are qualified assistants.

The most notable and alarming feature of the year, has been the very large increase of applications under section eleven. At a recent meeting, the number of applicants under this section, exceeded more than four to one, the number who obtained, at the same meeting, registered pharmacists certificates by examination.

By a firm and unsparing exercise of its discretionary power, the Board hopes to correct this evil.

An alphabetical list of the pharmacists registered during the year, is herewith appended.

Balance of money on hand at last report, two thousand, six hundred, and fifty-one dollars, and twenty-nine cents; amount received during the year, six hundred and thirty-four dollars, and twenty-five cents; total, three thousand, two hundred and eighty-five dollars, and fifty-four cents. Amount disbursed, one thousand, six hundred and eighty-seven dollars, and ten cents; balance on hand July 1st, 1889, one thousand five hundred and ninety-eight dollars, and forty-four cents.

A detailed statement by the Treasurer is herewith appended.

The fees as fixed by the act, are entirely too low to yield a sufficient sum to properly pay for the enforcement of the law. The amount of money received being barely enough to meet the expenses of the regular meetings of the Board.

Prosecutions for violation of the act, have not been numerous; one case was brought to trial, when the accused plead guilty; in another case a true bill has been found, and the accused awaits trial; a third case is in about the same condition. Several other persons who were carrying on the retail drug business in violation of the Act, have closed up or sold out, upon learning that they would be prosecuted.

One individual who neglected to apply for registration until after the expiration of the period provided for that purpose, appealed to the courts for a mandamus to compel the Board to register him; the court refused his application, sustained the action of the Board, and took occasion to speak very favorably of the Act itself.

That more prosecutions have not been instituted, is perhaps not owing to the non-violation of the Act, but is due to the unwillingness of pharmacists to furnish the Board with evidence suitable to take into court.

So many pharmacists were discovered who had failed to obtain registration, that it was considered advisable to appeal to the legislature for relief. Therefore, a supplement to the act, to re-open registration for another period of ninety days, was introduced at the late session of the legislature, and passed without a single adverse vote.

Statement of F. H. Eggers, Treasurer of the State Pharmaceutical Examining Board of Pennsylvania.

DR.

1888.			
July	1, To balance,		$2,651 29
Oct.	2, To cash H. B. Cochran, Secretary,		191 75
1889.			
Jan.	10, To cash H. B. Cochran, Secretary,		191 50
April	16, To cash H. B. Oochran, Secretary,		251 00
			$3,285 54

CR.

1888.				
July	25, By cash Alice C. Morrell,	warrant No. 39,		$38 60
	By cash H. B. Cochran,	warrant No. 40,		98 61
	By cash W. D. Stauffer & Co.,	warrant No. 41,		4 50
	By cash Inquirer Printing and Publishing Co.,	warrant No. 42,		23 15
	By cash H. B. Cochran, Secretary,	warrant No. 43,		100 00
	By cash Alonzo Robbins,	warrant No. 44,		123 37
	By cash F. H. Eggers,	warrant No. 45,		63 40
	By cash A. B. Burns,	warrant No. 46,		112 87
Oct.	17, By cash Inquirer Publishing Company,	warrant No. 47,		12 00
	By cash H. B. Cochran,	warrant No. 48,		106 22
	By cash Alonzo Robbins,	warrant No. 49,		118 55
	By cash F. H. Eggers,	warrant No. 50,		54 10
	18, By cash A. J. Tafel,	warrant No. 51,		53 25
	20, By cash A. B. Burns,	warrant No. 52,		120 30
1889.				
Jan.	17, By cash H. E. Slaymaker,	warrant No. 53,		22 00
	By cash Alonzo Robbins,	warrant No. 54,		48 65
	By cash H. B. Cochran,	warrant No. 55,		54 40
	By cash A. B. Burns,	warrant No. 56,		84 70
	By cash F. H. Eggers,	warrant No. 57,		99 80
	By cash A. J. Tafel,	warrant No. 58,		27 00
April	16, By cash Inquirer Publishing Company,	warrant No. 59,		9 50
	By cash Lancaster Examiner,	warrant No. 60,		24 30
	By cash A. B. Burns,	warrant No. 61,		29 60
	By cash A. J. Tafel,	warrant No. 62,		48 75
	By cash Alonzo Robbins,	warrant No. 63,		101 13
	By cash H. B. Cochran,	warrant No. 64,		42 60
	By cash F. H. Eggers,	warrant No. 65,		65 75
July	1, By balance,			1,598 44
				$3,285 54

Respectfully submitted,

F. H. EGGERS,

Treasurer of the State Pharmaceutical Examining Board of Pennsylvania.

Registered Pharmacists.

Frederick B. Read, Osceola Mills.
Whit A. Eckles, Wampum.
Wm. C. Fiske, 1411 Arch, Philadelphia.
Dudley H. Turner, Towanda.
Edward L. Baldwin, Laceyville.
Frederick L. Terppe, 510 Cedar avenue, Scranton.
H. B. Kauffman, Newburg.
Albert R. Griffith, Oil City.
Wm. C. McClintock, 69 N. Second, Philadelphia.
Wm. B. Burke, Sixth and Arch, Philadelphia.
George L. Jolly, Orangeville.
Charles M. Robinson, 4545 Frankford avenue, Philadelphia.
Godfrey Gibbs, Warnock and Huntingdon, Philadelphia.
Sylvester S. Smith, Driftwood.
Robert W. Young, Slatington.
J. Wilson Morrow, Marchand.
Thomas L. White, McKeesport.
Aaron C. Coble, Dauphin.
Samuel C. Burland, Chester.
W. H. Tassell, Shingle House.
Charles N. Williams, 25th and Columbia avenue, Philadelphia.
Wm. S. Glenn, State College.
Simon D. Addis, South Bethlehem.
Robert Morrison, Oak Dale station.
Mark L. Smith, 643 Snyder ave., Philadelphia.
Wm. Tag, 1900 Judson Place, Philadelphia.
Cleon L. Doty, Warren.
James W. Lowe, Girard.
Wm. M. Durham, St. Joe.
John D. Hamilton, Corapolis.
Ernest C. Stiefel, 1924 Carson st., Pittsburgh.
Atchison C. Anderson, Foxburg.
Henry T. Decker, Aiken avenue, Pittsburgh.
Thomas W. Renshaw, Tamaqua.
Adolph Prieson, Lock Haven.
Wm. E. DeLong, Broad and Ellsworth, Philadelphia.
Edward A. Morgan, 369 East Market, Wilkes-Barre.
Theodore A. St. Clair, 622 N. 39th, Philadelphia.
Harry L. Snyder, 528 Buttonwood, Philadelphia.
Wm. M. Denniston, Hollidaysburg.
James T. Smith, New Berlin.
Willis G. Gordon, Towanda.
Henry Mears, Towanda.
James P. McGarrah, Williamsport.
H. P. Helwig, Mt. Carmel.
S. Nelson Wiley, Norristown.
Edward E. Warner, 1001 South Seventh, Philadelphia.
James L. Clemens, Pottsville.
Thomas H. Carey, Carversville.
George H. Miller, McDonald.
Amos H. Smith, New Providence.
Theophile J. Ellinger, 4513 Lancaster avenue, Philadelphia.
Wm. A. Cantrell, Ninth and Moore, Philadelphia.
Wm. P. Brodie, Doylestown.
George R. Anderson, Portland.
Walter J. Proper, Pleasantville.
Charles B. Leitzell, Derry Station.
Sydenham P. Uhler, Stone Church.
Charles P. Jackson, 1634 N. Fifteenth. Philadelphia.
Wm. M. Angney, 519 Spruce, Philadelphia.
James D. Graver, Trappe.
Charles A. Haines, East Canton.
Philip A. Boyle, 1432 N. Second, Philadelphia.
A. A. Cunningham, Volunt.
John R. Rodgers, Hogestown.
James P. Beckley, 201 Carson, Pittsburgh.
Alphons Shober, 299 Ohio, Allegheny.
Henry Finkelpearl, 213 Locust, Pittsburgh.
August A. E. Venn, McKeesport.
Elmer E. Knight, Mansfield Valley.
Louis Genois, 1201 Chestnut, Philadelphia.
Albert T. Zeller, 123 North Fifteenth, Philadelphia.
C. Ferdinand Wild, 2023 Vine, Philadelphia.

August R. Hesske, 610 Franklin, Philadelphia.
W. Crutcher, 1600 Chestnut, Philadelphia.
Harry C. Haak, Pine Grove.
John Rea, Chester.
Rudolph Kindig, 2551 N. Broad, Philadelphia.
Richard H. Lackey, 1772 Frankford ave., Philadelphia.
Nicolaus Billstein, Chester.
Wm. O. Davies, Slatington.
George H. Jackson, Seventh and Arch Philadelphia.
James K. Field, 2245 Bouvier, Philadelphia.
George J. Kleinert, Pottsville.
Robert Simons, Paschall avenue between 72-73, Philadelphia.
Daniel E. Lewis, Ewardsville.
Nelson H. Hastings, Austin.
Albert C. Miller, Hillsville.
Cyrus A. McCaskey, 6 Meadow, Pittsburgh.
Albert M. Eaton, 1107 North Front, Philadelphia.
Henry M. Hall, 242 North Fifth, Phila.
Preston E. Stem, Allentown.
Ernest F. Appeldorn, 2028 Howard, Philadelphia.
John A. Biever, Lebanon.
David Taggart, Frackville.
Thomas H. Meserole, Parsons.
Frank R. Masser, Sunbury.
Wm. H. Montgomery, Glen Richey.
Thomas A. Price, Bridesburg.
Henry N. Bryan, 123 North Eleventh, Philadelphia.
Robert J. Sharp, Austin.
Wm. B. Cosgrove, New Derry.
John W. Carothers, Mill Hall.
Fred. H. Houghton, Austin.
Wm. H. Rodgers, Mifflintown.
Wm. B. Thompson. 1700 Mt. Vernon, Philadelphia.
Berthier McClure, Danville.
Wm. G. Keir, 1511 South Fourth, Philadelphia.
Charles E. R. McCloskey, 231 North Twelfth, Philadelphia.
Edward J. Hadfield, Jefferson College, Philadelphia.
Emile A. Perrenot, 717 North Thirteenth, Philadelphia.
Harold D. Owens, 39 North Twelfth, Philadelphia.
Edward Moore, Jr., 732 South Nineteenth, Philadelphia.
James Williamson, Twenty-fifth and Jefferson, Philadelphia.
Charles T. Phillips, Meyerstown.
Wm. W. Sheriff, 139 West Fourth, Williamsport.
L. B. Campbell, Luzerne.
Wm. A. Pierce, West Chester.
Charles E. Boger, 1703 Wallace, Philadelphia.
John S. Brown, Stroudsburg.
Reuben E. Moyer, 955 Randolph, Philadelphia.
Howard G. Robins, 453 North Tenth, Philadelphia.
Clifford G. Dunn, 3207 North Seventeenth, Philadelphia.
Jacob L. Nebinger, 4239 Lancaster ave., Philadelphia.
Agnila Hoch, 1634 Columbia avenue, Philadelphia.
Theo. Cappell, Home street, Pittsburgh.
Alfred C. Hyde, West Middlesex.
Oliver F. Lenhardt, Norristown.
J. Elmer Porter, Pottstown.
Chas. L. Mohn, Fremont.
Frank L. Blachly, Clarksville.
Henry T. Trumbauer, Coopersburg.
Chas. A. Bleiler, Frackville.
Chas. H. Bahl, 1002 North Sixth, Philadelphia.
Sidney B. Hotchkiss, Edinboro'.
James W. Harvey, Greensburg.
F. E. Drumheller, Sunbury.
Ai Thorn, Kylertown.
Chas. A. White, 1613 Filbert, Philadelphia.
Andrew D. Brewster, 1011 Carson, Pittsburgh.
John W. Bell, 36 Western avenue, Allegheny.
Palmer M. Kern, Bath.
Isaac M. Witmer, Conestoga.
John M. Gentry, Stony Fork.
Geo. L. G. Eggert, Parker's Landing.
W. G. Humphrey, Osceola.
Clarence S. Blackmon, Harmony.
Henry A. Nolte, 162 North Eighth, Philadelphia.
George L. Wagner, 818 Walnut, Allentown.
Aaron W. Musgrave, Welliversville.
George W. Wolfersberger, Campbells.
Aston H. Morgan, 383 East Market, Wilkes-Barre.
Howard E. Griffin, 204 West Market, Scranton.

Joel S. Reading, 1501 Christian, Philadelphia.
Charles W. Davis, 77 Ohio, Allegheny.
Frederick K. Bruckmann, 76 East, Allegheny.
Geo. C. Murdock, Wampum.
Samuel Aubley, Scottdale.
John B. Linezey, Doylestown.
Charles M. Cottam, Twenty-fourth and Montgomery avenue, Philadelphia.
Gustave A. Richter, 801 South Front, Philadelphia.
John H. Small, Jr., York.
Chas. L. Conwell, 237 Wyoming avenue, Scranton.

Qualified Assistants.

J. Wm. Kogelschatz, Norristown.
Aaron W. Musgrave, Bloomsburg.
James W. Roberts, Washington.
Martin S. Gillaspie, Edinboro'.
Geo. W. Scarborough, Yardley.
Curtis A. Harbold, Shrewsbury.
James T. Heverly, Howard.
Wm. L. Brallier, Lykens.
Benj. M. Good, Lancaster.
John S. Hursh, Newville.
Dewit C. Harrington, Wellsboro'.
David Dalton, Upland.
Henry T. Lefferts, Southampton.
Ira W. Davis, Ebensburg.
Harvey B. Eyer, Everett.
Charles D. Gillespie, Freeport.
J. Harry Krum, 223 North Sixth, Reading.
Wm. H. Deibert, Catasauqua.
John Irvine, Jr., Cumberland and Lee, Philadelphia.
Charles F. Potter, Laceyville.
Nathaniel Ross, Nanticoke.
Wm. D. Holmes, Corry.
Charles J. Dietz, 1225 Leopold, Philadelphia.
Wm. H. Vallowe, 20 Chestnut street, Allegheny.
Frederick V. Dunn, Tenth and Mifflin, Philadelphia.
Benj. F. Kendall, Conneautville.
George C. Steinmetz, Erie.
Fred. N. McCreary, Fairview.
Wm. A. Johnson, 454 North Fourth, Philadelphia.
Gibson H. Liesenring, 1708 North Tenth, Philadelphia.
David McMurtrie, 1106 Eleventh street, Altoona.
John W. Shaner, Greensburg.
Theodore W. Roth, Front and Dauphin, Philadelphia.
James W. McDonald, Dunmore.
John Sierer, 6322 Woodland avenue, Philadelphia.
J. C. Wilson, Mercersburg.
Samuel J. Riegel, Lebanon.
Wm. A. Alexander, Chester.
Oliver A. Stout, Thirteenth and Green, Philadelphia.
Edward R. White, 528 Arch, Philadelphia.
Charles J. Watkins, Olyphant.
George S. Jones, Scranton.
Tom. B. Craig, Freedom.
Wm. Neville, Conshohocken.
Allen J. Kendig, 2226 Wallace, Philadelphia.
J. Wm. McConnell, Canonsburg.
Ardon Finley, New Brighton.
Robert M. Hainer, New Castle.
Theodore B. Strohm, Newburg.
Charles R. Simpson, 1613 Eleventh ave., Altoona.
Harvey M. Seigfried, Allentown.
Allen W. Boyer, 730 North Sixteenth, Philadelphia.
John H. Williams, Norristown.
Charles F. Coldsmith, Mount Pleasant.
Thomas E. Mayes, Lewistown.
E. Frank Thompson, Titusville.
Louis Loeb, Doylestown.
Frank R. Welch, Tunkhannock.
Irwin B. Lutz, 353 South Sixth, Reading.
Charles O. Brown, 50 North Eleventh, Reading.
John K. Wittel, Mt. Joy.
Henry L. Klopp, 1444 North Nineteenth, Philadelphia.
Alfred B. Cadmus, 1647 Latona, Philadelphia.
Alvah M. Davis, Norristown.
Wm. H. Evans, Ashley.
Frank J. Welch, Shingle House.
Joseph F. Shreve, Eleventh and Master, Philadelphia.

Thomas Irvin, Jr., Centralia.
Edward J. Harbach, 138 Poplar, Reading.
George W. Fehr, 1920 Race, Philadelphia.
Walter P. Stimmel, Sixth and McKean, Philadelphia.
Irvin W. Furl, Lock Haven.
Harry M. Wilson, Big Run.
Frank J. Meek, Mt. Carmel.
John H. Fies, Lancaster.
James E. Lloyd, Northumberland.
Harry T. Copeland, Patterson.
Wm. F. Gordon, Rochester.
Elmer A. Keefer, 313 North Second, Harrisburg.
John R. Bissell, Mahanoy City.
Charles A. Seler, Allentown.
Sarah L. Morgan, Williamstown.
Wm. H. Mitchell, Driftwood.
Edward S. Fernsler, Pottsville.
Albert L. Brown, 829 Chestnut, Reading.
John A. Faull, 528 Fifth avenue, Pittsburgh.
James R. Fleming, Forest City.
Herbert W. Turner, 701 Chestnut avenue, Altoona.
Wm. A. Kulp, Lock Haven.
Joseph A. Roth, Erie.
Wilhelm J. Scheller, Fifth and Jefferson, Philadelphia.
Wm. W. Solliday, South Easton.
Abiather G. Rounseville, Coudersport.
Jacob H. Dewees, Norristown.
Harry R. Grunden, Parker City.
John F. Tinsman, 1900 Green, Philadelphia.
J. Fred. Groterent, 824 North Third, Harrisburg.
Charles F. Chandler, North Eleventh, Philadelphia.
J. Spurgeon Quinn, Kerseys.
Joseph Lowenberg, Norristown.
Ed. F. Pagan, Wellsboro'.
Milton Campbell, South Bethlehem.
James M. L. Whitfield, Bedford.
Edwin E. Pryor, Scranton.
Arthur E. Hanson, 2131 De Lancy Place, Philadelphia.
Roscoe C. Facley, Mt. Carmel.
Albert H. Koenig, 722 North Third, Philadelphia.
John R. Jones, 387 North Main, Wilkes-Barre.
Tilghman W. Yeager, Thirteenth and Lombard, Philadelphia.
Joseph H. Marvill, 32 North Ninth, Philadelphia.
Robert L. McFarland, Sharon.
Wm. A. Strode.
Walter R. Elliott, Renovo.
Franklin N. Boyer, 36 Wood, Reading.
George W. Hackney, 1106 Chestnut, Philadelphia.
Percy G. Leidich, Thirteenth and Race, Philadelphia.
John L. Thomas, McKeesport.
Harvey Long, Middletown.
Frank L. Thomson, 1410 Chestnut, Philadelphia.
John G. Goehring, West Newton,
Charles E. Martin, 177 Second avenue, Pittsburgh.
Louis J. Bischoff, 64 Troy Hill Road, Allegheny.
John J. Bilheimer, 432 Eustis, Philadelphia.
Franklin B. Scheirer, Hackendauqua.
Byron E. Henderson, Sharpsburg.
Charles F. Lamb, Milton.
David H. Emery, Towanda.
Jonathan K. Lippen, Manayunk.
Charles A. Ridgway, Hydetown.
Pinckney N. Pinchback, 229 N. Twelfth, Philadelphia.
Clara Aiken, Berwyn.
Robert Glenk, 725 Huntingdon, Philadelphia.
Alfred George, Hanover.
Wm. T. Cale, Columbus.
Ahab H. Lippincott, Jr., 117 East Cumberland, Philadelphia.
John Scott, Jr., 3728 Market, Philadelphia.
Harry W. Rogers, Elmer.
Martin I. Wilbert, 600 North Eleventh, Philadelphia.
Louis A. Minner, 541 East Thompson, Philadelphia.
George McL. Bowman, Bridgeton.
John P. Sheehan, Eleventh and Diamond, Philadelphia.
John N. Prass, Twenty-ninth and Poplar, Philadelphia.
Charlie B. Miller, Goldsboro'.
David B. Watson, Birmingham avenue, Pittsburgh.
Frederick Krauss, 1712 North Third, Philadelphia.
Will J. Schen, Washington.
Clarence N. Cornelius, Seventh and Poplar, Philadelphia.
Harry H. Swainbank, Wilkes-Barre.
Irvin S. Schmehl, 531 Penn, Reading.
G. Corson Taggart, Norristown.
Harry F. Simons, 418 Gerker, Philadelphia.

Orville E. Allen, Coudersport.
John P. Benedict, 113 Federal, Allegheny.
Bella C. Magowan, Kane.
Alice E. Hastings, Austin.
Chas. F. McCaw, New Brighton.
Frank Gillespie, Freeport.
Sherman W. Nixon, East Stroudsburg.
Anne McGinty.
A. Herman Poth, 1322 Carson, Pittsburgh.
Charles W. Fister, Hamburg.
Louis P. Haeberle, 919 North Twenty-fifth, Philadelphia.
John B. Limpert, 4114 Penn avenue, Pittsburgh.
Edward E. Frontz, 1236 South Eighth, Philadelphia.
Lester I. Lorah, Emlenton.
Harry Fredericks, 722 North Forty-third, Philadelphia.
A. Clark Smith, Reynoldton.
George B. Klein, Lebanon.
William W. Jones, Williamsport.
Albert A. Appel, Judson Place and Berks, Philadelphia.
Charlie Widdup, Dunbar.
Robert L. Dubbs, 2801 Girard avenue, Philadelphia.
Kate V. Palmer, 2801 North Twelfth, Philadelphia.
Geo. C. Tyler, Bristol.
Wm. D. Barr, East Brady.
Margaret C. Hanby, Manayunk.
George G. Stropp, Greensburg.
George L. Baner, 1419 Clarion, Philadelphia.
Frank H. Dunham, Oil City.
Harry Guest, Eighth and Race, Philadelphia.
Howard C. Eggers, 172 Ohio, Allegheny.
W. M. Elliott, Mercersburg.
Wm. H. Frantz, Coal Centre.
Philip Goll, 1427 East Susquehanna ave., Philadelphia.
David W. Seville, Bellevue.
M. N. Smith, Reynoldstown.
Ernest M. Fischler, Gaines.
John M. Graves, Jermyn.
Ida German, Southampton.
Joseph McManus, 3831 Fairmount ave., Philadelphia.
Casper T. Logan, Millerstown.
Claud Field, 239 North Eleventh, Philadelphia.
Ben. C. Keller, 123 North Tenth, Philadelphia.
David C. Gibbony, 1126 Vine, Philadelphia.
Edwin L. Janson, 1124 Vine, Philadelphia.
James C. Perry, 4122 Havreford avenue, Philadelphia.
Robert B. Scott, 2401 East Huntingdon, Philadelphia.
John D. Mulheron, 1200 Callowhill, Philadelphia.
Simon M. Butt, 145 North Tenth, Philadelphia.
Charles P. Jacob, 707 Vine, Philadelphia.
Ellis B. Burgess, 16 North Thirty-seventh, Philadelphia.
J. John Schoff, 1028 Race, Philadelphia.
Joseph B. Bilderback, Fortieth and Locust, Philadelphia.
Fred. K. Bowman, 1949 North Eleventh, Philadelphia.
Frank K. Carman. 231 North Twelfth, Philadelphia.
Clarence T. Eldredge, 1922 Mt. Vernon, Philadelphia.
Harlan J. Mentzer, 3952 Lancaster ave., Philadelphia.
John W. Norrison, 1207 Race, Philadelphia.
George J. Schade, 64 North Fourth, Philadelphia.
Thomas B. Reilly, 920 South Fifth, Philadelphia.
Wm. M. Merkle, Eighth and Cumberland, Philadelphia.
Henry J. Walls, 608 Richmond, Philadelphia.
Frederick A. Weiss, Thirty-fourth and Pine, Philadelphia.
Wm. P. Barnett, 500 Christian, Philadelphia.
Augusta C. Burns, Montrose.
Joe H. Kelly, Carbondale.
Harry G. Duff, New Castle.
Edward O. Ensign, Waymart.
George A. Knowles, 1124 South Twenty-second, Philadelphia.
Elmer L. Cameron, Chambersburg.
Jas. L. Carothers, 1634 Columbia ave., Philadelphia.
A. Bert Reese, Nanticoke.
E. Elmer Palmer, Bristol.
Wm. A. Markley, 154-156 South Sixth Reading.
Philip H. Utech, Meadville.
U. Gilbert Ruff, Twenty-fourth and Lombard, Philadelphia.
Cynenius M. Dodge, Honesdale.
Henry A. Kalkman, Honesdale.
John B. Smith, Germantown.

Harry L. Greer, Greensburg.
Ralph L. Melick, Sunbury.
Russell L. Blackwood, Bristol.
William H. Pratt, Camden.
David Y. Walts, West Chester.
John W. Shultz, Lancaster.
G. P. G. Graham, Homer City.
Samuel Sutton, 321 South Main, Wilkes-Barre.
John H. Anderson, Third and George, Philadelphia.
Harvey N. Stem, 727 Hamilton, Allentown.
Richard H. Simmons, Shamokin.
John Loftus, Scranton.
Clarence J. Springer, Sewickley.
Harry C. Graham, Fourth and Lancaster avenue, Phila.
Edwin S. Holcomb, Westfield.
Wilton A. Duer, Murrysville.
Ferdinand G. Angney, Darby.
Franklin J. Miller, South Bethlehem.
Oscar T. McDonough, California.
Louis Leix, 1329 Third avenue, Altoona.
Samuel S. Hamaker, 124 Market Harrisburg.
Joseph M. Bricker, Somerset.
Bernard F. Scherer, 3844 Haverford avenue, Philadelphia.
Luther S. Henkel, 214 West Fourth, Williamsport.
George E. Flora, Bangor.
William H. Eyre, Chester.
Edward V. Weller, Tarentum.
Harvey E. Mellinger, Mt. Pleasant.
John B. Doty, 1301 Market, Philadelphia.
Harry P. Rhoads, Doylestown.
Samuel L. Lane, West Chester.
Morgan Rees, Plains.
Ira Carrier, Punxsutawney.
Oscar W. Payne, Scranton.
James R. McDonough, Dunmore.
George P. Reed, Jr., Washington.
Benjamin F. Wolfinden, 500 South Ninth, Philadelphia.
John B. Nason, Townville.
Thomas S. Lindsey, Mercer.
Emma Corrie, Eleventh and McKean, Philadelphia.
Geary A. Weston, Millersville.
James L. Kelly, South Chester.
John W. Hough, 6322 Woodland avenue, Philadelphia.
Lewis A. Breidinger, Ninth and Race, Philadelphia.
Erwin C. Shafer, Montoursville.
Benjamin C. Ely, Girard.
Oliver C. Devine, 1823 Dickinson, Philadelphia.
Charles W. Wagner, Hartleton.
Samuel J. Apple, Indiana.
Frank M. Lindman, Kittanning.
Alfred N. Van Dyke, 1701 Sumner, Philadelphia.
Russell L. Coxe, Schuylkill Haven.
William W. Bright, Ridge and Girard ave., Philadelphia.
Harry A. Bacon, Seventh and Brown, Philadelphia.
John D. Rishell, 32 North Ninth, Philadelphia.
William J. N. Gervais, Fifth and Spruce, Philadelphia.
Charles A. Mueller, 621 North Third, Philadelphia.
James D. Karcher, 632 North Eighteenth, Philadelphia.
William D. Barnard, 214 North Twelfth, Philadelphia.
William F. Eberhardt, 625 North Second, Philadelphia.
Warren C. Pine, 4552 Germantown avenue, Philadelphia.
William H. Kunkle, 1844 Franklin, Philadelphia.
Clarence E. Carritte, 1022 Race, Philadelphia.
D. Bruce Richards, 1726 North Eighteenth, Philadelphia.
J. Victor Rosenkrans, Newton, New Jersey.
William Griffin, 1432 Monsey avenue, Scranton.
Edward J. Melvin, 237 Wyoming avenue, Scranton.
Harry C. Swartley, 1801 Chestnut, Philadelphia.
Richard W. Livezey, Doylestown.

APPENDIX H.

CORRESPONDENCE.

I. Letter to the Chief Burgess of Emaus.
II. Correspondence with the Sanitary Committee of Wilkes-Barre.
(*a*). Letter to the Chairman.
(*b*). Reply of the Chairman.
III. Diphtheria at Antrim, Tioga county.
IV. Transportation of Dead Bodies.
(*a*). Letter of Baggage Agents.
(*b*). Letter of H. P. Dearing.
(*c*). Letter of Spencer Meade.
V. To the Meteorological Committee of the Franklin Institute.
VI. Misappropriation of the name State Board of Health in advertising.
(*a*). Letter to District Attorney, George S. Graham, Esq.
(*b*). Letter from Attorney General W. S. Kirkpatrick, Esq.
VII. Circular of the Pennsylvania Railroad on Disinfection.
VIII. Petition for a Chair of Forestry in the University of Pennsylvania.

I.—LETTER TO CHIEF BURGESS OF EMAUS.

PHILADELPHIA, *Jan.*, 12 1889.

Mr. Jonathan Bickel, Chief Burgess of Emaus.

DEAR SIR:—I regret to learn through the Boards Inspector, Dr. McIntire, that new cases of diphtheria are constantly appearing in your borough and that the disease continues to be of a malignant form. In order to aid you in your humane efforts to check its progress, and thus save life and prevent suffering among your people I enclose an order declaring the disease epidemic and issuing certain regulations in the name of the Board. You will post at least two of these in conspicuous positions, and place one in the hands of every physician, clergyman and justice of the peace within five miles of your town. I am anxious to render you all possible assistance in this emergency and shall be gratified if you will call upon me for information in regard to any other points that suggest themselves to you. I enclose forms which physicians should use in reporting cases to you. These or copies of them should be returned to me, at the end of each month.

I have the honor to be, Yours very respectfully,

BENJAMIN LEE, *Secretary.*

II.—CORRESPONDENCE WITH THE SANITARY COMMITTEE OF WILKES-BARRE.

(a.) LETTER TO THE CHAIRMAN.

PHILADEPLHIA, *May* 20th, 1889.

Col. S. H. Sturdevant, Chairman Sanitary Committee, Wilkes-Barre.

DEAR SIR:—Medical Inspector Taylor reports the occurrence of two cases of small pox, one of them fatal, in your city. He also informs me that your committee is acting with great promptness and decision. With the example of the unfortunate results of the opposite method of dealing with an epidemic at its outset, which you have had in Nanticoke, you cannot be too much on the alert. Free vaccination should be offered at once to all not able to pay for it: all the school children in the city should be vaccinated, beginning with those in the immediate neighborhood of the infected district. If you have no small pox hospital one should be established without delay, at a distance from other habitations. The risk of attempting to treat cases in their own houses, especially the poor who are crowded together, is very great. This was exemplified to an alarming extent in the last epidemic in this city. I have secured decisions which place the right of sanitary authorities to remove patients without their consent or that of their friends, and to use whatever amount of force may be necessary in so doing. The State Board of Health will back you up in the exercise of your powers to the most arbitrary extent in this matter. The time to cope with an epidemic is at its very outset before the flames have had a chance to spread and the sparks to fly. Nanticoke must be full of the seeds of the disease, judging by the way new cases crop out from time to time. It is a question whether some supervision should not be exercised over the communication between the two places. I trust you will not hesitate to consult Dr. Taylor and myself freely in regard to all points in which you are in any doubt as to the safest course to pursue. I send copies of our rules for Boards of Health containing instructions for establishing temporary hospitals, which may be of service.

Yours very respectfully,
BENJAMIN LEE, *Secretary.*

(b.) REPLY OF THE CHAIRMAN.

WILKES-BARRE, PA., *May* 22, 1889.

Dr. Benjamin Lee, Secretary State Board of Health.

DEAR SIR:—I have your valued favor of 20th inst. The two cases small pox mentioned by you (one dead) are all that have made their appearance yet, and we think we have good reason to hope that no more will occur, unless we have a fresh importation from Nanticoke.

With what we have had we have used most rigid measures to prevent spreading, through quarantine, vaccination, competent nurses etc., We have also as precautionary means, had or are having all the school children in the district, vaccinated, adopting the rule of your board, as given in your circular, and have every thing ready to erect tents, kitchen, etc., for a temporary hospital, in case of future spread of the disease, with competent nurses, cook, etc., secured. In short, so far as human foresight can go we think we are prepared to sit down on the disease very effectually, realizing all the time, an "ounce of prevention is better than a pound of cure" and that "eternal vigilance is the price of liberty."

Again thanking you for your timely letter which I shall take the first opportunity to lay before our board.

I am very truly yours,

S. H. STURDEVANT,

Chairman Sanitary Committee.

III.—DIPHTHERIA AT ANTRIM, TIOGA COUNTY.

Doctor Benjamin Lee, Secretary State Board of Health.

DEAR SIR:—Enclosed find a small card and circular relating to diphtheria. My object in forwarding this, is to ascertain if I have exceeded my authority, and to let you know just what I am trying to do in the matter.

To explain, our place is a semi-bituminious coal district, inhabited as you know, by many nationalities. The houses stand quite near each other, while many families occupy blocks, in which are *several* families. For the last three or four years, we have experienced some time during the year, an outbreak of diphtheria. Our first was followed by upwards of a hundred cases, and many deaths. At this time, I was unable to control in a satisfactory manner either the disposal of the dead, or the running *in* and *out* of the neighbors. Our second outbreak was followed by a smaller number of cases, and proportion of deaths, correspondingly less. At this time, through the officials of the company, who by the way, aid me in every way they can, I was afforded the satisfaction of curtailing to some extent, the *abominable* visiting, which in my opinion, had the effect to, in some degree, stay the progress of the disease.

As the third outbreak came on, I had succeeded in securing from your board, the appointment, the title of which I give myself at the bottom of the card. I then issued cards something similar to the enclosed. The result was a very few cases. At our last outbreak which occurred but a few weeks since, I issued the enclosed cards.

In placing anything of the kind before our people, it must be decided. The turpentine, its manner of use, you may disagree with me in, but it comes from a good source, and at any rate, thoroughly aroused the people, for they very quickly consumed the company's stock, and set themselves at work doing everything in their power to guard against the disease. And now I have only to call their attention in some such way to awaken a general interest in such matters. I would state too, that my plan during the third and last appearance of the disease among us, has been as follows:

Immediately upon discovering the appearance of diphtheria, I quarantined the house, and all inmates of the same. They cannot go outside the yard. For their groceries at the Company's store, I take their memorandum and pass it to one of the clerks, who sees that the family is provided for. There is positively no one admitted to the house, but myself or assistant. In case of death the body is immediately wrapped in a sheet, wet with a solution of chloride of mercury, placed in casket, and as I have done in one or two instances, the latter is also wrapped in a sheet, wet with the same solution, and placed in the outside box, and disposed of, within a brief space of time after the death, sometimes not waiting longer than four or five hours. The house and its contents are then thoroughly fumigated with sulphur. The friends and nurse before going outside take a bath and make a change of clothing through out. By this means there is no doubt, but that I have succeeded in cutting short the threatened epidemic, and have now arrived at the *very satisfactory* point, where public sentiment stands ready to endorse my efforts in this direction; and in my opinion the little circular has done the greater part of it.

Yours very truly,
E. G. DRAKE, M. D.

IV.—TRANSPORTATION OF DEAD BODIES.

(a.) LETTER OF BAGGAGE AGENTS.

PHILADELPHIA, *April 8th*, 1889.

Benjamin Lee, Esq., Secretary State Board of Health, Harrisburg, Pa.

DEAR SIR:—We, the undersigned, general baggage agents of the railways interested in the matter of transporting dead bodies in the state of Pennsylvania, would respectfully call your attention to the corrected rules and samples of forms approved at the San Francisco meeting of the National Association of General Baggage Agents, of which we are members; also to that part of the records of our proceedings which gives the full report of the committee.

There is seemingly but one sentiment among health officers, as well

as railroad men; that the interests of the public health demand uniformity in the matter of transporting the bodies of the dead, yet, this is not an easy thing to accomplish, unless the various State Boards of Health are willing to yield something in the interests of harmony.

After due consideration of all suggestions offered we believe the rules now proposed cover all essential features, and reflect the views of the majority of those to whose attention the subject has been called.

While hoping that eventually all conflicting opinions may be entirely harmonized, we think it advisable that a beginning should be made, and would therefore suggest that these rules go into effect about September first of this year. We suggest this date, as it will give ample time to give notice in the larger towns and cities to all undertakers.

Will you kindly lay the matter before the State Board of Health for approval, and advise Mr. J. E. Quick, Secretary, Detroit, Michigan, of the result of your deliberations as soon as convenient?

We would add, that similar letters are being sent to the several state boards of health.

F. J. McWADE, G. B. A., P. R. R.
G. E. ZIPPEL, G. B. A., D. L. & W. R. R.
J. J. POST, G. B. A., N. Y., L. E. & W. R. R.
H. W. SOUDERS, G. B. A., P. & R.
E. B. BYINGTON, G. P. A., L. V. R. R.
R. R. BENTLY, G. B. A., PENNA. Co., P. C. & S. L. R.
E. W. UTLEY, G. B. A., ALLEGHENY VALLEY.
C. W. BASSETT, G. B. A. PITTSBURGH & WESTERN R. W
A. C. CLARK, G. B. A., PITTSBURGH & LAKE ERIE R. R.

(b.) LETTER OF H. P. DEARING.

Mr. F. J. McWade, G. B. A. Penna. Co., Philadelphia, Pa.

DEAR SIR:—Referring to your favor of the 20th enclosing correspondence from Mr. Benjamin Lee, Secretary Pennsylvania State Board of Health, in the matter of transporting dead bodies. I must confess that the rules and transit permit of the Pennsylvania State Board of Health are so good, so far ahead of so many others, and practically so near like ours that I dislike to say that they ought to change them. In fact, the medical gentlemen are better able to judge of their duty in the matter. I am advised by Mr. Quick however, that replies from quite a number of state boards indicate that the rules proposed by our Association will be approved by nearly all, and possibly in the interest of uniformity the Pennsylvania Board will agree to adopt our rules in their essential features in the event that our rules are generally adopted by the other state boards. The principal discrepancy appears to be in the matter of disinfectants as required in Rule 2, and otherwise it occurs to me the railroads in Pennsylvania can harmonize

with them so they are practically the same. Thus in Rule 7 a paster is required giving certain information. I think this could be arranged between the undertakers and the railroads at all principal points and it is not essential that the State Board of Health pass upon it. However I would not care to assume to decide these points, but am only giving my individual opinion, but I trust you will bring the matter before the Association so we can discuss it fully.

(Signed) Yours truly,

H. P. DEARING.

(c.) LETTER OF SPENCER MEADE.

Dr. Benjamin Lee, Secretary and Executive Officer, Board of Health, State of Pennsylvania.

DEAR SIR:—Both our company, and the persons having in charge the transportation of dead bodies from Pennsylvania into New York state are being very much inconvenienced and embarrassed owing to the Health Officers in Pennsylvania not using the form of transit permit required by your Rule 7 of your regulations.

While the regulations issued by the board of health of New York State will permit transportation of dead bodies accompanied by a transit permit issued on regular form of either states, they will not permit the transportation of dead bodies on a doctor's certificate, or an informal certificate from the health officer, and in consequence all bodies received over our road for movement from Pennsylvania in New York state, we are required to secure the necessary information from the certificate accompanying the body, and secure from the health officer at Elmira a proper transit permit, and the body has to be held until same is secured.

We had a case to-day of a dead body forwarded from Williamsport, Pa., for Auburn, N. Y. The information given on the ecrtificate issued by the health officer at Williamsport was not sufficient to enable the health officer at Elmira to issue a transit permit, the date of death and age of deceased not being given. We took occasion to enquire of health officer Richter of Williamsport why he did not use the regular form of transit permit as authorized by your board and he answered that he was not supplied with blanks, and therefore simply endorsed the certificate of the attending physician.

The form of transit permit is very generally used in this state, and I think has been found by physicians and others a great convenience, and I am sorry your Board did not make the use of them in Pennsylvania obligatory, as is done in New York state, as the Pennsylvania transit permit is accepted for transportation in New York state the same as one issued by a Health Officer of this state.

I would suggest that for the better convenience of the public and rail-

roads having occasion to transport dead bodies, that your health officers be furnished with a blank form of transit permit and be requested to use them. By doing this you will not only accommodate the railroad companies having lines running between the two States, but will save a great deal of annoyance and inconvenience to persons having in charge dead bodies passing from Pennsylvania into New York state.

Yours respectfully

SPENCER MEADE.

V.—TO THE METEOROLOGICAL COMMITTEE OF THE FRANKLIN INSTITUTE.

To the Meteorological Committee of the Franklin Institute.

GENTLEMEN:—I have been deeply interested in reading the report of the State Weather Service in the Annual Report of the Department of the Internal Affairs for 1887. Considering the brief time which has elapsed since the inauguration of that important bureau and the small amount of money placed at its disposal as compared with the extent of its field, the systematic completeness of its work is remarkable, and compares favorably with that of other states in which such a service has been in operation for many years. I say this not unadvisedly, having been compelled for the past fifteen years, as chairman of the Committee on Meteorology and Epidemics of the Philadelphia County Medical Society. Lecturer on Hygiene to the State Medical Society, and, later, Secretary of the State Board of Health, to keep a careful watch in this highly practical department of science. The relationship of atmospheric conditions to health has always been recognized, as witness the phrase, as old as our language—"under the weather"—but never until the systematic observation of the last few years, maintained uninterruptedly by an immense number of observers over large areas of territory, has the opportunity been afforded for such intelligent study of this relationship as might lead to practical results in the preservation of the public health. As a single instance of the value of such studies I would call your attention to the admirable paper by Provost William Pepper, of the University of Pennsylvania, on the "Geological Distribution of Consumption of the Lungs and Malaria" in this state, which will be found in Second Annual Report of the State Board of Health. Among the results which may undoubtedly be arrived at by the labors of this service, if generously supported by the state government, is the determination of points of unusual salubrity within our borders to which invalids may resort, either for temporary relief or for permanent abode, and thus be saved exhausting journeys and the sadness and tedium of exile. The diversities of the climate of

this immense commonwealth probably offer many such regions now unsuspected, which may not only afford refuge to our own citizens, but may attract seekers after health from all parts of the country. To the elucidation of these subjects the State Board of Health designs to devote careful attention, and it hopes to find in the State Weather service an earnest and efficient co-laborer.

My object in addressing this communication is to inquire whether, with the clerical force now at its disposal, your committee, which I understand to have virtual control of the service, would be able to furnish me meteorological reports modified to suit the especial requirements of sanitary investigation. Precisely what those modifications might be I am not in a position to state until I have a more thorough knowledge of the work now done, but I may say in a general way that it would involve considerable abridgement or condensation, and arrangement with reference to the different seasons. Trusting that our departments may be able so to co-operate in their efforts to promote the common weal as to place Pennsylvania in the front rank of progressive and enlightened commonwealths in these respects as she is already in the development of her natural resources.

I am gentlemen, with great consideration,

Your obedient servant,

BENJAMIN LEE, *Secretary.*

VI. MISAPPROPRIATION OF THE NAME "STATE BOARD OF HEALTH" IN ADVERTISING.

(a.) LETTER TO DISTRICT ATTORNEY GEO. S. GRAHAM, ESQ.

PHILADELPHIA *May, 15th,* 1889.

George S. Graham, Esq., District Attorney, Philadelphia, Penna.

DEAR SIR:—Enclosed you will please find an advertisement of "Cotton Seed Oil," together with the back of the wrapper in which it was enclosed. It is evident that the article is being extensively advertised in this manner: the object being, to convey the impression that the State Board of Health is endorsing it. I have consulted the Attorney General of the state, as to whether a department of state government, cannot be protected against such a false assumption of its name. He replies "that there is no statute especially providing for such a case." I therefore, appeal to you to know whether the parties thus advertising would not be liable to indictment for obtaining money by false pretenses; or, whether, if several persons concerned in it, the transaction might not be held to be an indictable conspiracy. Should you hold that action in either of these directions is justified, I shall be glad to confer with you in regard to the prosecution.

Yours very respectfully,

BENJAMIN LEE, *Secretary.*

(b.) LETTER FROM ATTORNEY GENERAL W. S. KIRKPATRICK, ESQ.

HARRISBURG, *May 14th*, 1889.

Benjamin Lee, M, D., Secretary State Board of Health.

DEAR SIR:—I beg leave to acknowledge your communciation of May 3d, enclosing advertisement of cotton seed oil, together with the back of the envelope in which it was sent, and asking to be informed in what way the State Board of Health can be protected against such a misappropriation of its name.

I find no statute specifically providing for such a case. The sending of the envelope enclosing the advertisement, resulting in a purchase of the article advertised, and the payment therefor by the customer under the impression that the article in question has received the approval and endorsement of the State Board of Health, contrary to the fact, might make the person sending, as well as the person authorizing the advertisement to be sent, under such circumstances, if with the intent to deceive and to obtain money upon the strength thereof, liable to an indictment for obtaining money by false pretenses. It would seem to be analogous to the case of the use of a false brand or trade mark for the purpose of imposing upon a customer or buyer a spurious article. I would refer to Wharton's Criminal Law, 9th Edition, vol 2. sec. 1158, for several illustrations of this principle.

The combining of two or more persons for the purpose of imposing an article upon the public, under the circumstances which you detail in your communication, by the use of a device or brand or advertisement calculated to mislead buyers into the purchase of a spurious or inferior article, might also be held to be an indictable conspiracy.

Of course I am only suggesting possible cases in the absence of further details as to the circumstances under which the particular advertisement and envelope enclosing the same, which I herewith return, were sent. It would be very proper for you to consult the District Attorney and lay before him the facts, and he could then determine whether the elements of an indictable offense exist.

Very respectfully yours,

W. S. KIRKPATRICK,

Attorney General.

VII.—CIRCULARS OF RAILROAD COMPANIES ON DISINFECTION.

(a.) CIRCULAR OF PENNSYLVANIA RAILROAD.

The efficiency of the service depending largely on the health of the empolyés, the attention of all is called to the following points, in regard to disinfection, and general preventive measures against disease.

Cleanliness.

One of the most important means of preventing disease is cleanliness, not only of the body, but also of surroundings. No disinfectant or medicine can take its place. The following rules must be observed:

I. All shops, stations, and adjacent grounds, as well as the tracks between stations, must be kept scrupulously clean. DECAYING ANIMAL OR VEGETABLE MATTER, AND RUBBISH OF EVERY KIND MUST BE BURNED.

II. The floors and seats of privies must be scrubbed with soap and water not less than once in two weeks, and the vaults emptied whenever the material accumulates to within three feet of the surface of the ground. In no case should a privy vault be less than five feet deep.

III. Drains and sewers must be flushed with fresh water as often as once a week, if the water supply will admit.

IV. Passenger cars must be thoroughly ventilated, and the plush beaten frequently. The paint and glass must be washed at least once in two weeks.

V. THE CLOSETS OF PASSENGER CARS, ESPECIALLY THE FLOOR, URINAL, AND HOPPER, MUST BE WASHED AT LEAST ONCE A WEEK WITH "P. R. R. DISINFECTANT." ACCORDING TO DIRECTIONS GIVEN.

VI. Freight cars at stations must be cleaned before leaving the station, and if the refuse from these cars cannot be satisfactorily disposed of otherwise, it must be burned.

Water Supply.

Too great care cannot be exercised in keeping the water supply used for drinking and household purposes, free from contamination, impure water being one of the most effective means of spreading disease. The following points should be observed:

I. Privies and stables and outlets of drains and sewers, are frequently so located, that the drainage therefrom finds its way readily into the water supply. This should never be.

II. As a rule it is better to take water supply from rapidly running streams than from any other source, and always some distance above the nearest contamination. Springs, where the high land surrounding them is free from impure drainage, are excellent sources of water supply. Wells, especially those near dwelings, should be avoided.

III. In all cases where a water suspected of contamination, must be used for drinking, or as a constituent of food, such water should be boiled and then allowed to cool and settle before it is used. It is better not to add ice to the boiled water, as ice itself is frequently contaminated. Boiled water may be readily cooled by having it in a metal or earthen vessel; and after wrapping a wet towel around the vessel, placing it in a current of air, or by placing ice in contact with the vessel outside.

IV. Garbage and rubbish of all kinds near the water supply, must be burned or removed.

Disinfection.

The best disinfectant known is simply fire. Burn up everthing in the shape of filth, and it will never cause further difficulty. In some cases however, this is impossible, and in such cases disinfectants and antiseptics are properly used, especially, [1] to remove offensive odors, [2] to render decaying organic matter, which cannot be burned, less dangerous, [3] and, most important, to destroy disease germs. It is believed that the P. R. R, disinfectant, will accomplish each of these results. If it is properly used after filth and rubbish of all kinds have been burned or disposed of as directed above, offensive odors everywhere will be reduced to a minimum, and the danger of disease will be very greatly diminished.

I. This disinfectant must be used freely, and all persons in charge of shops, stations, cars, or any portion of the company property, will be held strictly responsible that the property is as clean and free from odor as possible. P. R. R. disinfectant is made under the supervision of the Laboratory at Altoona, and may be obtained in boxes holding two dozen bottles, by making requisition on Altoona shops. Directions for use accompany each bottle. For use where slight stain is objectionable, a special form of P. R. R. disinfectant is made, which does not stain.

II. For disinfecting clothing, bed linen, or other articles which have become contaminated, and which it is not desirable to burn, the best disinfectant is simply to boil in water, for at least half an hour.

III. Sulphate of copper, or blue, vitriol, also known as "blue stone," is a very valuable disinfectant. In damp places, in privy vaults, and in cesspools, it may be used freely in the dry form, being simply coarsely powdered, and scattered around. In other places it should be dissolved in water before use, not less than one-half pound to the gallon of water.

IV. Ice is very valuable in preventing decomposition, and in this sense is a good antiseptic. It may be used with great advantage on passenger cars, and in the urinals of water closets at stations. In all places where the supply will admit, a lump of ice must be kept in the urinal of every passenger car, while the car is in service.

Infectious Diseases.

If at any time a case of infectious disease is found at a station, in a passenger car, or elsewhere on the Company's property, a physician should be immediately sent for. The car should be removed from the train as soon as practicable, the doors locked, and it should not again be used, until it has been fumigated.

All employés are expected to heartily co-operate in the above measures for preventing disease, and they are earnestly recommended to apply them also at their own homes.

GENERAL MANAGER.

(b.) THE PHILADELPHIA AND READING RAILROAD COMPANY

PHILADELPHIA, *September 16th*, 1889.

Circular No. 1. The attention of all officers and employés is directed to the following regulations, in regard to disinfection and the prevention of disease:

All stations, yards, shops and adjacent grounds, as well as the line of road in general, must be kept absolutely clean and free from decaying animal or vegetable matter and from rubbish of every kind. Especial care must be taken to remove offensive odors and to destroy disease germs where these are believed to exist, and for this purpose, disinfectants must be freely used wherever necessary.

The floors and seats of privies, and the floors, urinals and hoppers of closets in passenger cars, must be thoroughly scrubbed once a week, or as much oftener as may be necessary. A suitable quantity of proper disinfecting material must be kept in urinals at stations, and in those of passenger cars when in service.

Passenger cars must be carefully ventilated, and the paint, glass and upholstery kept neat and clean. The floors of stock and other freight cars must be cleaned immediately after the cars are discharged, and the refuse must be burned, if it cannot be otherwise disposed of.

Great care must be exercised to prevent the pollution of water which is used for drinking and household purposes. Privies, stables and sewers must never be so located, that the drainage from them finds its way into the water supply. If it becomes necessary to use water which is suspected of being dangerously impure, it should be boiled and allowed to cool and settle, before it is used.

All drains and sewers on the company's premises must be thoroughly flushed with clean water once a week, if the water supply will admit.

Privy wells must be made at least five feet deep, and the contents must never be allowed to accumulate within three feet of the surface. In disinfecting wells, sulphate of copper, commonly called blue-stone, or sulphate of iron, known as copperas, may be used to advantage in a dry state, care being taken that the disinfectant reaches all parts of the well.

When a case of infectious disease is found in a passenger car, or at a station, a physician should be called at once. The car must be removed from the train without delay, and it must not again be placed in service until it shall have been thoroughly cleansed and fumigated.

Such articles as clothing, bed linen, etc., which may require disinfection, should be boiled in water for at least half an hour.

Division Superintendents will be held personally responsible for the enforcement of these rules, and to that end, they must provide for thorough and systematic inspection of the property under their charge.

A. A. McLEOD,
Vice-President and General Manager.

VIII.—PETITION FOR A CHAIR OF FORESTRY IN THE UNIVERSITY OF PENNSYLVANIA.

March 21st, 1889.

To the Trustees of the University of Pennsylvania.

GENTLEMEN:—Permit me to suggest the establishment of a Chair and Department of Forestal Science at the University of Pennsylvania.

Such action would meet the commendation of all thoughtful citizens, as it must be admitted that this nation will in time pass, in a greater or lesser degree, through the experience common to all the countries of Europe, where government aid and collegiate instruction has been found necessary to arrest wanton destruction of natural forests and to develop and protect artificial ones.

The forestry schools of France, Germany, Austria and Switzerland are models of excellence.

In Austria, the leading schools are those of Fulenberg, Weisswasser, Lunenberg; all under the oversight of the University of Austria-Hungary In Bavaria, the University of Munich provides a complete forest course for professional foresters, such students taking a preparatory course at the Royal Forestry school at Aschanffeburg. In Saxony, the Forestry Academy of Thaiandt, near Dresden, is one of much celebrity. In other parts of Germany the forest academies of Eberswalde, Muenden, Newstadt, Eisenach and Giessen are well known. In Switzerland the polytechnic school of Zurich has an important forestry department. In France the forest school of Nancy, with its preparatory school at Barres, has an international reputation. These various schools are known all over the world by the labors of the many highly educated botanists, ornithologists, vegetable physiologists, entomologists and forestal engineers, which they have sent abroad.

While botanical science has been long taught in our leading schools, very little has been done in the line of education in theoretical or practical forestry.

The trustees of Harvard College have recognized the importance of this subject, and have, through the publication of the work pursued at the Arnold Arboretum, done much to disseminate information and develop increased interest in the scientific treatment of practical forestry.

Thus there is an open field for a new course of study and practice which may be of inestimable benefit to the nation.

If the city councils purchase Bartram garden for park purposes, it might be turned into a botanic garden or forestry station for deciduous trees, and its proximity to the University would make such a disposition of it most desirable, in case the proposed chair of forestry should be endowed or otherwise established, and what could be more fitting than that the birthplace of botanical knowledge and arboriculture in America, should be the site for instruction in forestal subjects by the leading educational institutions of the state.

Yours respectfully,

BENJAMIN LEE,

Secretary State Board of Health.

APPENDIX I.

COMPLAINTS ON WHICH ACTION WAS TAKEN DURING THE YEAR ENDING NOVEMBER 13, 1889.

1. McAllisterville, Juniata county.
2. Troy, Bradford county.
3. Berwick, Columbia county.
4. Chester, Delaware county.
5. Eldred, McKean county.
6. Gallitzin, Cambria county.
7. Preston, Bryn Mawr, Montgomery co.
8. McKee's Rocks, Allegheny county.
9. Kingsley, Luzerne county.
10. Middletown, Dauphin county.
11. Dry Run, Franklin county.
12. New Florence, Westmoreland co.
13. Kilkenny, Delaware county.
14. Hulmeville, Bucks county.
15. Nanticoke, Luzerne county.
16. Rankin, Allegheny county.
17. Trout Run, Lycoming county.
18. Allegheny, Allegheny county.
19. Berwyn, Chester county.

1. Complaint of typhoid fever in the McAllisterville soldiers orphan school, Juniata county. Medical Inspector Sibbet reported that the air of the neighborhood had been contaminated by the removal of privy contents, and that there was reason to suspect the pollution of the water supply from the kitchen drain. The Board recommended that the soil around the wells, for a depth of two feet and a radius of ten feet, be replaced by impervious clay, and surface drainage diverted therefrom. Also isolation of the sick and disinfection of the hospital.

2. Complaint of insanitary condition of Troy, Bradford county. The medical inspector reported the pollution of a stream running through the town, the source of the pollution being a tannery draining into this stream. The Board recommended the authorities of Troy to construct a sewer through the town to prevent this nuisance.

3. Complaint of pollution of ice-supply of two ponds at Berwick, Columbia county, from the Jackson Manufacturing Company. Medical Inspector Leiser examined the ponds and took samples for analysis. Dr. Chas. M. Cresson reported that one specimen was pure and the other was unfit for consumption and dangerous. The report of the analysis was forthwith sent to the company with the order of the Board forbidding the use of ice from the pond contaminated.

4. Complaint of nuisance from pollution of air caused by an offensive piggery at Chester, Delaware county. Medical Inspector Atkinson reported on examination that the piggery was a nuisance, and the Board ordered its removal. Chief of Police Newsome shortly afterwards reported the pig pens had been removed and the nuisance abated.

5. Complaint of pollution of well at Eldred, McKean county, causing typhoid fever. Medical Inspector Free reported that fifteen cases of typhoid fever had been caused by the use of water from this well, and clearly demonstrated the pollution. The board instructed the authorities to fill this well up.

6. Complaint of insanitary condition of Gallitzin, Cambria county,

causing an epidemic of diphtheria and several deaths. Medical Inspector Dudley reported the town to be without any water supply or drainage system, and complete apathy on the part of the residents as regarded the epidemic. He attributed the epidemic to the filthy conditions in which the people lived. He had furnished the council with documents as regards the precautions to be adopted, and strongly urged the dissemination of the circulars of the Board with a view of impressing the people with the importance of cleanliness.

7. Complaint of a nuisance at Preston, a suburb of Bryn Mawr, Montgomery county, maintained by an odorless excavating company, and caused by dumping the contents of privy wells and cesspools.

Further correspondence resulted in the secretary being informed that the nuisance had been abated.

8. Complaint of a nuisance from a stagnant pond at McKee's Rocks Station, Stowe township, Allegheny county. The complaint was to the effect that a pond, in area about one and one-half acres, had been made stagnant owing to interference by the Lake Erie Rail Road Company of a natural course, thereby causing malarial fever etc. The Board ordered that an immediate representation of this matter be made to the Rail Road Company.

9. Complaint of a nuisance from a creamery at Kingsly, Luzerne county, by waste whey, etc. Medical Inspector Taylor, on investigation verified the complaint, and recommended that a drain be laid from the creamery to convey the residual products to a safe distance. This the owners carried out, on suggestion from the Board, and the nuisance was abated.

10. Complaint of a nuisance from slaughter houses, etc., at Middletown, Dauphin county. Medical Inspector Hartman reported that all the nine slaughter houses in the town were in a bad, insanitary condition, to which he attributed cases of typhoid fever. He recommended that the slaughter houses be removed outside the town and all filthy premises cleaned. The Board considered the borough authorities were competent to abate these nuisances.

11. Complaint of an epidemic of typhoid fever at Dry Run, Franklin county, caused by the pollution of a well. Medical Inspector Sibbet reported that human and animal excreta deposited near the well, found its way therein, thereby causing the pollution. He had cautioned the people in this valley against using the water from this and other wells which he considered dangerous, and advised the immediate adoption of stringent measures of precaution, which the Board approved.

12. Complaint of nuisance from stagnant condition of the Pennsylvania canal at Florence, Westmoreland county. Deputy Medical Inspector Tomb reported the water in the canal stagnant, and generally in foul condition, with from six inches to about two feet of putrid mud in the bottom. The weeds on the banks shut out the sun, and there

was a bad odor from the canal, many cases of malarial fever being annually attributed to it. The secretary had communicated with the Canal Company on this subject, and the chief engineer had replied promising immediate attention.

13. Complaint of nuisance from manure heaps, wells and imperfect drainage at Kilkenny, Montgomery county. Medical Inspector Atkinson, on investigation verified the report. The Board ordered an immediate abatement, and the order had been complied with.

14. Complaint of a nuisance from a slaughter house at Hulmeville, Bucks County. Medical Inspector Atkinson reported finding 26 pigs in a pen in this slaughter house, which were being fed on blood and slaughter house offal. There was no floor to the pen, the drainage running on the ground. The Board ordered that the pen be removed outside the town, and that the proprietor cease feeding swine on slaughter offal.

15. Complaint of nuisance from a well at Nanticoke, Luzerne county, causing typhoid fever. Medical Inspector Taylor had examined the well and taken a sample of the water for analysis. On examination of this water, the analysis revealed contamination. The Board ordered that the use of water from this well be forbidden.

16. Complaint of nuisance at Rankin, Allegheny county, from filthy condition of a dwelling house. Medical Inspector Thompson reported that he found the complaint true in the main. He had caused the household effects to be disinfected and taken such other precautions as rendered the house sanitary.

17. Complaint of unsanitary condition of Trout Run, Lycoming county, caused by the June flood washing out privy vaults and contamination of wells. Medical Inspector Payne had visited the place and recommended that the cellars and other receptacles of filth be cleaned and disinfected.

18. Complaint of nuisance from pollution of Butcher's run, Allegheny County. The secretary had inspected the run, accompanied by the health officer of Allegheny and other officials. He found the stream badly polluted by sewage, garbage, and butchers' refuse, and he had forthwith condemned it as an unqualified nuisance. The Board ordered that the property holders do their part in abating the nuisance, advising the construction of a covered sewer as the remedy. The local authorities had accordingly given instructions for a properly constructed sewer.

19. Complaint of nuisance caused by contamination of a stream of water at Berwyn, Chester county. Mr. Howard Murphy, the Board's engineer reported the stream complained of badly contaminated by sewage from a hotel. The hotel authorities had given an assurance that they would endeavour to abate the nuisance, if time were allowed them. Action deferred.

APPENDIX K.

METEOROLOGICAL OBSERVATIONS.

STATE WEATHER SERVICE.

[Extracted, by permission, from the Report to the Secretary of Internal Affairs, for the State Board of Health, by W. B. Atkinson, A. M., M. D., Medical Inspector for the Delaware District.

For the year 1889, the observations have extended to fifty-one counties. Sixty-eight observers have recorded their observations for the year.

January, 1889. The mean temperature, 31.9, is about 5 degrees above the average, and 9.8 above that of January, 1888. The mean of the daily maximum temperature was 31.6, and of the daily minimum temperature, 27.2. The warmest period of the month was the 17th, and the coldest from the 19th to the 23d inclusive.

The highest temperatures reported were Westtown, 68°.0; Carlisle, 65°.0; Reading, 64°.5; McConnellsburg, 64°.0; Lancaster, 64°.0, and New Bloomfield, 64°.0. The lowest were Charlesville, minus 5°; Emporium, minus 5°; Honesdale, minus 3°; Smethport, minus 2°.5; Hollidaysburg, minus 2°; New Castle, minus 2°; Coudersport, minus 2°, and Wellsboro', minus 2°. Stations with the highest mean for the month were Philadelphia, 37°.3; Uniontown, 36°.5; Pittsburgh, 35°.2; Catawissa, 35°; Pottstown, 35°, and Indiana, 34°.9.

Those with the lowest were Eagles Mere, 26°.6; Honesdale, 27°.8; Phillipsburg, 28°.3; Greenville, 28°.7; Coudersport, 28°.6, and Clarion, 29°.1.

BAROMETER.

The mean pressure, 30.05, is .05 below the normal. The highest readings noted were on the 17th, 19th and 23d, and the lowest on the 9th and 27th. That of the 9th accompanied the tornadoes which passed over the state on that date.

PRECIPITATION.

The average rainfall, including melted snow, was 3.54 inches, which is slightly above the normal. The fall was very evenly distributed, both during the month and over the state. Light snow squalls were frequent. The heaviest snowfall occurred on the 20th. The greatest totals in inches for the entire month were, Meadville 21; Eagles Mere, 19; Coudersport, 18; Somerset, 13; Wellsboro', 12, and Rimersburg, 12. Very little snow remained on the ground at the end of the month.


RADFORD
Montrose
Wyson
Towanda
Roy
SUSQUEHANNA
WAYNE
Dyberry
Honesdale
Tunkhannock
South Easton
WYOMING
LACKAWANNA
SULLIVAN
Eagles Mere
Laporte
Scranton
Blooming Grove
Milford
PIKE
Wilkesbarre
LUZERNE
COLUMBIA
MONTOUR
Bloomsburg
Danville
Catawissa
Orvilton
MONROE
Stroudsburg
CARBON
Mauch Chunk
Sunbury
NORTHAMPTON
Girardville
Easton
SCHUYLKILL
Pottsville
Lynnport
Bethlehem
LEHIGH
Hamburg
Allentown
Coopersburg
Quakertown
LEBANON
BERKS
BUCKS
Annville
Lebanon
Reading
Doylestown
MONTGOMERY
Pottstown
Plueinsville
Norristown
LANCASTER
CHESTER
Lancaster
Coatesville
West Chester
Swarthmore
Westtown
Media
DELAWARE
York
Kennett Square
PHILADELPHIA

WIND AND WEATHER

The prevailing wind was from the west. On the 9th, severals portions of the state were visited by tornadoes, which did a large amount of damage. Owing to the extreme mildness of the month plowing was done and no ice harvested. Winter grain is reported in good condition.

Average number.—Rainy days, 10; clear days, 9; cloudy days, 9.

MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for January, 1889*

COUNTY.	STATION.	Elevation above sea level (feet)	BAROMETER			TEMPERATURE.											
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Allegheny*	Pittsburgh	847	30.020	30.470	29.010	35.2	61.0	16	17.0	22	42.7	30.3	12.4	29.0	23	4.0	7
Beaver	Rochester	821															
Bedford	Charlesville	1,300				31.3	59.5	17	— 5.0	23	40.4	25.0	15.4	43.0	23	2.0	20
Berks,*	Reading	304	30.063	30.595	29.251	32.1	64.5	17	7.0	23	.4	25.0	16.4	26.0	23	6.0	27
Blair,†	Altoona	1,181				37.0	59.0	18	14.0	23	44 8	29.3	15.5	25.0	19	8.0	6
Bradford	Wysox	718				30.0	59.0	17	0.0	30	36.9	21.4	15.5	32.0	23	3.5	2
Bucks	Quakertown	536	30.040	30.580	29.230	32.4	59.0	17	7.0	23	41.9	24.0	17.9	35.0	23	5.0	27
Cambria	Johnstown	1,184															
Cameron	Emporium	1,030				30.5	56.0	17	— 3.0	23	38.2	22.4	15.8	39.	23	4.0	14
Centre	State College— Agricultural Experiment Station	1,191	30.091	30.676	29.152	30.1	57.0	17	10.0	23	37.2	21.7	15.5	24.	24	5.0	1
Chester	West Chester	455	30.028	30.573	29.178	34.0	58.0	9	16.0	30	42.	28.3	13.8	25.	9	4.0	6
Clarion	Clarion— State Normal School	1,530				29.1	56.5	17	6.5	28	37	21.6	16.0	28.	23	5.5	7
Clearfield	Grampian Hills	1,450				28.8	52.0	17	6.0	23	34.4	23.8	10.6	30.	23	2.0	7
Clinton	Lock Haven	560				32.0	57.0	17	0.5	23	37.5	22.4	15.	29.	23	4.0	7
Columbia	Catawissa	491				35.0	62.0	17	11.0	23	41	28.0	13.3	29.	23	3.0	28
Crawford	Meadville— Allegheny College	1,050	30.137	30.615	29.280	30.1	56.5	15	12.1	19	40.9	27.6	13 3	20.0		3.0	8
Cumberland	Carlisle	480				33.2	65.0	17	4.0	23	41.0	27.5	3.5	31.0	23	0.5	5
Dauphin,*	Harrisburg	361	30.086	30.620	29.210	32.6	62.0	17	13.0	23	39.3	25.5	3.8	28.0	17	6.0	27
Delaware	Swarthmore— Swarthmore College	190	30.041	30.442	29.392	35.7	56.5	18	17.9	20	41.8	28.8	13.0	23.7	23	3.8	6
Erie.*	Erie	681	30.020	30.550	29.220	31.0	58.0	16	12.0	20	38 0	27.0	11.0	23.0	16	2.0	28
Fayette	Uniontown	1,000	30.000	30.366	29.157	36.5	62.0	16	13.9	22	46.3	27.5	18.8	40.0	23	6.0	21
Forest	Tionesta	1,058				29.5	54.0	17	4.0	23	38.	24.0	14.1	39.0	23	3.0	8
Franklin,*	Chambersburg— Wilson Female College	618															
Fulton	McConnellsburg	875				33.6	64.0	17	2.0	23	43.	26.4		40.0	23	7 0	27
Huntingdon	Huntingdon— The Normal College	650				32.5	61.0	17	1.5	23	38.	23.0	15.7	39.5	23	2.5	7
Indiana	Indiana State Normal School	1 350				34.9	59.0	16	8.0	30	1.	27 5	14.3	30.0		.0	20
Lackawanna	Scranton	750															
Lancaster	Lancaster— Franklin and Marshall College	413	30.065	31.068	29.225	34.9	64.0	17	14.5	23	1.	26.	15.8	27.5	23	5.5	6

Lawrence.	New Castle.	932				33.2	56.0	17	— 2·0	22	39.3	23.2	16.	38	23	5.0		
Lebanon.	Lebanon.	480	30.041	30.595	29.205	33.0	62.0	17	11·5	23	. . .	26.2						
Luzerne.	Drifton—																	
	Drifton Hospital.	1,655				30.4	60.0	17	7.0	19	41.7	23.0	18.	36.0	26	.0		
McKean.	Smethport.	1.500				30.0	52.0	17	— 1.5	23	35.2	24.1	11.	48.5	23	3.0		
Mercer.*	Greenville—																	
	Thiel College.	1,000	30.063	30.492	29.982	28.7	54.6	17	9.0	22	38.2	24.0	14.	36.1	23	4.0		
Montgomery.	Pottstown.	150				35.0	58.0	17	16.0	23	40.8	29.4	10.	21.0	4	2.0		
Northampton.	Bethlehem.	360																
Northumberland.	Shamokin.	733																
Perry.	New Bloomfield.	400				31.7	64.0	18	0.0	23	42.	22.9	19.	38.0	23	6.0	27	
Philadelphia.*	Philadelphia.	117	30.070	30.630	29.190	37.3	59.0	17	18.0	20	45.0	32.0	13.	24.0	9	5.0	6	
Potter.	Coudersport.	1,670				28.6	50.0	4	2.0	23	36.	20.5	15.	43.0	24	0.0		
Schuylkill.	Girardville.	1,000	30.070	30.575	29.444	32.7	51.0	9	10.0	25	40.0	24.0	16.0	33.0	25	5.0		
Snyder.	Selinsgrove.	445				33.3	55.0	17	8.0	22	39.1	29.1	10.0	27.0	23	1.0		
Somerset.	Somerset.	2,250				30.7	54.0	4	7.5	23	39.5	23.4	16.1	29.0	31	4.0		
Sullivan.	Eagles Mere.	2,060	30.112	30.615	29.277	26.6	50.0	17	— 1.0	20	32.2	21.2	11.	26.	20	4.0		
Susquehanna.	Montrose.	1,656																
Tioga.	Wellsboro'.	1,327	30.013	30.605	29.180	29.7	58.0	17	2.0	23	37 8	23.9	13.9	20.4	19	4.6	16	
Venango.	Franklin.																	
Warren.	Columbus.	1,410	30.016	30.735	29.354	29.2	50.0	17	4.0	23	35.9	22.5	13.4	42.4	23	2.0		
Wayne.	Honesdale.	1,000				27.8	54.0	17	— 3.0	23	35.1	20.6	14.5	36.0	23	4.0		
Westmoreland.	Greensburg.	1,075																
York.*	York.	385																

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	Total snowfall during month.	Depth of snow on ground at end of month.	Number of days rain-fall.	NUMBER OF DAYS Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Allegheny	Pittsburgh	74.6	24.7	25.0	5.40	1.00	14	4	8	19	W	W	W
Beaver	Rochester												
Bedford	Charlesville	75.1	23.8	3.81	9.50	0.50	9	9	10	12	W	W	W
Berks,*	Reading			3.74	4.50		9	12	9	19	NW	NW	NW
Blair,†	Altoona	74.3	29.0	1.82			7						
Bradford	Wysox	83.0	25.0	2.70	8.00	3.00	10	8	4	19	NW	NW	NW
Bucks	Quakertown	83.0	27.1	4.58	5.25		11	10	13	8	NW	NW	NW
Cambria	Johnstown												
Cameron	Emporium	78.0	23.0	2.75	7.50		10	5	11	15	W	W	W
Centre	State College— Agricultural Experiment Station	90.2	27.9	1.97	6.61	1.50	7	9	12	10	W	W	W
Chester	West Chester	73.0	27.1	4.78	2.50		13	16	5	10	NW	NW	NW
Clarion	Clarion— State Normal School	85.0	24.2	3.35			5	5	12	14	SW	SW	SW
Clearfield	Grampian Hills			3.32	17.00	6.50	14	4	13	14	W	W	W
Clinton	Lock Haven			3.48	9.00	2.00	6	11	4	10	W	W	W
Columbia	Catawissa			3.22	6.25	2.40	10	10	11	10	W	W	W
Crawford	Meadville— Allegheny College	70.1	27.4	4.25	21.00	6 00	13	11	4	16	SW	S	S
Cumberland	Carlisle	75.0	27.8	3.49	4.00		12	9	10	12	W	W	W
Dauphin,*	Harrisburg			2.86	4.50		11	7	12	12	NW	NW	NW
Delaware	Swarthmore— Swarthmore College	80.0	29.0	4.80	2.00		6	8	10	13	NW	NW	NW
Erie,*	Erie			2.71			19	2	11	18	S	S	S
Fayette	Uniontown	79.0	30.0	2.34			11	8	14	10	SW	W	W
Forest	Tionesta	85.0	25.2	3.50	10.00	4.00	14	5	7	19	W	W	W
Franklin,*	Chambersburg Wilson Female College												
Fulton	McConnellsburg	76.0	26.5	3.53	7.50		7	13	7	11	W	W	NW
Huntingdon	Huntingdon— The Normal College			2.84	5.00		7	8	10	13	W	W	W
Indiana	Indiana— State Normal School	89.0	32.1	2.94	8.10	4.00	14	3	9	19	W	W	W
Lackawanna	Scranton												
Lancaster	Lancaster— Franklin and Marshall College	74.8	26.7	2.83	2.50	0.50	11	10	12	9	W	W	W

Lawrence	New Castle	89	29.8	3.17	10.50	1.00	7	3	7	21	SE	SE	SE
Lebanon	Lebanon	79.8	28.3	4.26	5.20	1.00	11	11	9	11	NE	SW	SW
Luzerne	Drifton—												
	Drifton Hospital			3.74	3.25		8						
McKean	Smethport	80.0	24.0										
Mercer.*	Greenville—												
	Thiel College	89.3	25.8	3.52	7.87	1.50	14	2	8	21	W	SW	W
Montgomery	Pottstown	72.0	27.0	4.12	5.00		9	16	9	6	W	W	W
Northampton	Bethlehem												
Northumberland	Shamokin												
Perry	New Bloomfield			3.52	8.50	1.00	6	15	5	11	W	W	W
Philadelphia.*	Philadelphia	72.0	28.6	75	1.75			14	6	11	W	W	NW
Potter	Coudersport	78.2	22.3	80	17.50	6.00		11	5	14	W	W	W
Schuylkill	Girardville			80	9.00	3.00		14	7	10	NW	NW	NW
Snyder	Selinsgrove	79.	27	00	7.50			5	12	14	NW	NW	NW
Somerset	Somerset	86.0	27.2	3.48	12.75	4.00	4						
Sullivan	Eagles Mere	71.1	19.0	92	19.25	8.50	10	8	9	14	SW	SW	SW
Susquehanna	Montrose												
Tioga	Wellsboro'	80.9	24.5	02	12.40	3.20	14		8	19	S	SW	SW
Venango	Franklin												
Warren	Columbus			3.22	6.00	2.00							
Wayne	Honesdale			.15		5.50	11						
Westmoreland	Greensburg												
York.*	York												

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

PRECIPITATION FOR JANUARY, 1889.

	Erie.	Greenville.	New Castle.	Meadville.	Columbus.	Pittsburgh	Clarion.	Uniontown.	Indiana.	Somerset	Grampian Hills.	Emporium.	Phillipsburg.	Huntingdon.	Hollidaysburg.	Altoona.	Charlesville.	State College.	McConnellsburg.	Lock Haven.	New Bloomfield.	Carlisle.	Wellsboro'.	Harrisburg.	Selinsgrove.	Wysox.
1.					.10									.03						.02						
2.																										
3.																										
4.																										
5.	.10	.52	.12	.58		.38		.16		.55		.18	.20	.30	.57	.24	1.12		.81	.82	.75	.33	.60	.34	.80	.93
6.	.28	.27		.28	.60	.07		.07	.40	.18	.80	.39	.80	.44	.19	.42	.29	.78	.19	1.00	1.05	.85	1.40	.38	1.00	.28
7.	.05	.02	.55	.16	.06	.06	.64		.01		.06	.02	.02										.05	.02		.05
8.									.20																	
9.	.08	.39	.37	.35	.37	.29	.52	.28	.15	.58	.35	.30	.20	.62	.37	.25	.71	.33	.65	.38	.75	.43	1.64	.61	.90	.4
10.	.04				.03											.08						.07				
11.	.03	.05	.03		.09	.02	.05				.02		.01					.02								
12.	.02					.01			.05				.02													
13.	.02																									
14.								.05																		
15.				.11																						
16.	.06	.34	.35	.20	.35	.17	.29		.20								.07				.15		.40	.10	.10	
17.	.04	.04				.05		.22			.34	.28	.18	.16			.15		.40	.08	.02	.56		.52	.30	
18.	.01	.01		.20	.02													.09								
19.	.03																									
20.	.07	.29		.30	.18	.20			.15	.50		.50			.80		.67		.75			.01		.22		.41
21.	.08	.29		.45	.05	.20		.13	.20	.30	.66		.36	.50		.45	.21	.20				.71	.16	.08		
22.													.02													
23.																										
24.	.04		.30		.16	.09		.03	.43		.10	.11											.05			
25.						.01																				
26.								.12		.43					.04		.06		.06			.02	.30	.10	.10	.09
27.	.82	1.11	1.45		1.00	.71		.98	.75	.48	.55	.64	.32	.70	.59	.03	.58	.50	.42	1.18	.80	.34	.10	.42	.70	.38
28.	.22	.09		.33	.10	.13		.04	.05	.30	.18	.18	.26			.35						.04	.10	.01	.10	.10
29.	.02	.01		.15	.03	.04	1.85		.15	.12			.02									.05				.01
30.				.47					.10		.04												.02			
31.		.09		.05	.07	.07		.26	.10	.04	.22	.15						.06	.25			.09	.20	.08		
	2.71	3.52	3.17	4.25	3.22	2.50	3.35	2.34	2.94	3.48	3.32	2.75	2.41	2.84	2.56	1.82	3.81	1.97	3.53	3.48	3.52	3.49	7.02	2.86	4.00	2.70

PRECIPITATION FOR JANUARY, 1889—*Continued.*

	Eagles Mere.	Catawissa.	Girardville.	Lebanon.	Lancaster.	Drifton.	Reading.	Pottstown.	West Chester.	Coatesville.	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Coudersport.	Selsholtzville.	Frederick.	Ottsville.	Smith's Corner.	Doylestown.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.
1.											.01													
2.																								
3.																								
4.																								
5.	.76	.16	.39	.39	.39	.90	.56	.40	.93	.71	.50	.46		.41										
6.		.70	.36	.20	.09	.42		.22	.23	.27	.82	.44	.73	.15	.60	.69	.47	.74	.87	.98	.38	.52	.49	.77
7.						.08	.51			.01	.05	.01												
8.																								
9.	.86	.83	.95	.90	.44	.82	.72	.65	.72	.77	.44	.83	.54	.52	.60	.75	.69	.61	.73	.57	.66	.58	.60	.71
10.	.11																							
11.																								
12.																								
13.																								
14.																								
15.																								
16.	.51	.10	.31	.17	.08	.76	.17	.40	.11	.05		.16		.08	.40									
17.		.34	.62	1.08	.47	.15	.37	.15	.81	.62	.47	1.01	1.34	.95		1.23	.72	1.04	.83	.83	.71	.65	1.28	.90
18.																								
19.																								
20.	1.19	.33	.63	.47	.32	.24	.50	1.00	.55	.62	.98	.50	1.40	.18				1.41						
21.				.43	.48		.53		.60	.69		.51		.90	.70	1.19	.98		1.05	1.53	.78	1.29	.94	1.65
22.															.20									
23.																								
24.					.10		.02	.20	.10	.10	.01	.07		.06	.10	.03	.10		.07	.06	.09	.05		
25.									.03	.02			.17	.09										
26.		.01	.08	.03	.05				.02	.02				.02										
27.	.59	.45	.32	.44	.31	.37	.36	.45	.62	44	.78	.58	.58	.38	1.50	.39	.44	.50	.58	.55	.30	.46	.42	.55
28.	.54	.10		.04					.03	.01		.01												
29.											.03				.50									
30.																								
31.	.36	.20	.14	.11	.10			.05	.03		.06				.20		.04		.04		.03		.03	.06
	4.92	3.22	3.80	4.22	2.88	3.74	3.74	4.12	4.78	4.33	4.15	4.58	4.80	3.75	4.80	4.28	3.44	4.30	4.19	4.32	2.95	3.55	3.82	4.64

FEBRUARY, 1889.

TEMPERATURE.

The mean temperature for February, obtained from the daily observations of forty-six stations, was 23°.0, which is 6° below the normal.

The mean daily maximum and minimum, 31°.3 and 14°.8 respectively, give a monthly mean of 23°.0.

Uniontown reports an average daily temperature of 30°.0, and Eagles Mere 12°.0, which are the two extremes.

The highest temperatures reported were Indiana, 60°; Uniontown, 58°; McConnellsburg and Phillipsburg each 56°. The lowest were Coudersport, minus 27°; Smethport, minus 27°; Columbus, minus 26°; Grampian Hills, minus 21°; Clarion, minus 21°; Emporium, 20°, and Wellsboro,' minus 20°.

The low temperature occurred on the 24th.

BAROMETER.

The mean pressure for the month, 30.14, is .05 above the normal. The highest pressure occurred during the cold period of the 24th, and the lowest on the 5th and 18th. Rain and snow storms attended these depressions.

PRECIPITATION.

The amount of rain and melted snow for the month averaged 1.96 inches, which is 1.25 inches less than the normal. The precipitation was evenly distributed throughout the state, and at quite regular intervals during the month. Snows were numerous, but soon melted in the agricultural districts. The greatest total snow falls in inches for the month were Eagles Mere, 28; Smethport, 20; Phillipsburg, 18; Wellsboro,' 18; Coudersport, 17, and Grampian Hills, 17. No heavy drifts occurred.

WIND AND WEATHER.

The prevailing wind was from the west. No severe gales occurred. Owing to the rapid melting of the snows, winter grain has been much exposed, but at the end of the month it had not been materially injured. The ice harvest was abundant.

Average number.—Rainy days, 9; clear days, 7; fair days, 9; cloudy days, 12.

Monthly Summary of Reports *by Voluntary Observers of the Pennsylvania State Weather Service for February, 1889.*

County.	Station.	Elevation above sea level (feet).	Barometer. Mean.	Barometer. Highest.	Barometer. Lowest.	Temperature. Mean.	Maximum. Highest.	Maximum. Date.	Minimum. Lowest.	Minimum. Date.	Mean of maximum.	Mean of minimum.	Daily Range. Mean.	Daily Range. Greatest.	Daily Range. Date.	Daily Range. Least.	Daily Range. Date.
Allegheny,*	Pittsburgh,	847	30.118	30.750	29.370	27.3	53.0	17	- 1.0	24	34.9	21.2	13.7	32.0	5	6.0	6
Beaver,	Rochester,	821															
Bedford,	Charlesville,	1,300				24.0	51.0	17	- 9.0	24	32.5	16.7	15.8	35.0	23	4.0	28
Berks,*	Reading,	304	30.202	30.765	29.615	24.5	43.5	5	- 4.0	24	35.5	17.3	18.2	34.0	23	5.0	18
Blair,†	Altoona,	1,181				70.0	51.0	18	- 3.0	24	39.1	20.9	18.2	34.0	23	7.0	3
Bradford,	Wysox,	718				17.1	44.0	17	- 15.0	24	27.0	10.4	16.6	30.1	21	2.5	7
Bucks,	Quakertown,	536	30.120	30.820	29.460	24.3	16.0	17	- 4.5	24	34.3	15.4	18.9	28.7	21	7.5	18
Butler,	Butler,																
Cambria,*	Johnstown,	1,184															
Cameron,	Emporium,	1,030				21.8	45.0	22	-20.0	24	31.3	8.5	22.8	50.0	31	7.0	23
Centre,	State College—Agricultural Experiment Station,	1,191															
Chester,	West Chester,	455	30.156	30.825	29.480	26.3	44.0	5, 7	2.0	24	26.6	19.3	7.3	25.5	23	2.0	28
Clarion,	Clarion—State Normal School,	1,530				20.0	46.5	17	-21.0	24	29.2	11.4	17.8	34.1	21	2.5	14
Clearfield,	Grampian Hills,	1,450				18.2	42.0	22	- 24.0	24	25.3	11.1	14.2	40.0	21	2.0	17
Clinton,	Lock Haven,	560				22.0	49.0	22	-11.0	24	29.8	11.1	18.7	34.0	14	8.0	28
Columbia,	Catawissa,	491				26.7	48.5	22	- 5.0	24	32.3	17.8	14.5	28.5	15	4.0	1
Crawford,	Meadville—Allegheny College,	1,050				23.2	45.0	10	- 9.0	24	25.0	12.6	12.4	21.0	15	1.5	23
Cumberland,	Carlisle,	480				26.1	42.5	9	0.0	24	32.9	20.2	12.7	30.0	9	1.5	16
Dauphin,*	Harrisburg,	361	30 194	30.860	29.640	25.0	44.0	17	1.0	24	31.2	19.2	12.0	21.0	21	3.0	12
Delaware,	Swarthmore—Swarthmore College,	190	30.185	30.742	29.505	28.1	47.8	5	0.5	24	35.7	21.5	14.2	25.1	23	6.7	18
Erie,*	Erie,	681	30.120	30.800	29.350	21.0	54.0	16	-10.0	24	29.0	14.0	15.0	37.0	5	3.0	1
Fayette,	Uniontown,	1,000	30.070	30.599	29.414	30.0	58.0	16	1.0	24	36.2	19.8	17.4	26.0	16	6.0	28
Forest,	Tionesta,	1,058															
Franklin,*	Chambersburg—Wilson Female College,	618															
Fulton,	McConnellsburg,	875				26.4	56.0	17	2.0	24	36.7	19.2	17.5	40.0	23	5.0	16
Huntingdon,	Huntingdon—The Normal College,	650				24.0	41.0	18	- 8.0	24	28.9	13.6	15.4	29.0	8	4.0	6
Indiana,	Indiana—State Normal School,	1,350				26.4	60.0	18	-11.0	24	32.9	18.5	13.4	31.0	21	2.0	20
Lackawanna,	Scranton,	750															

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.											
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Lancaster	Lancaster— Franklin and Marshal College,	413	30.164	30.815	29.457	26.4	44.0	3, 9	— 1.5	24	34.4	18.9	15.5	26.5	23	7.0	15
Lawrence,	New Castle,	932	. . . .	. . . .	. . . .	24.7	50.0	17	—11.0	24	32.7	14.5	18.2	37.0	5	5.0	27
Lebanon,	Lebanon,	480	30.167	30.847	29.471	25.8	44.8	22	0.0	24	34.2	19.2	15.0	32.4	23	4.1	18
Luzerne,	Drifton — Drifton Hospital,	1,655	. . . .	. . . .	. . . .	18.7	47.0	. . .	—13.0	. . .	32.0	10.1	21.9	33.0	. . .	11.0	. . .
[illegible]cKean,	Smethport,	1,500	. . . .	. . . .	. . . .	29.8	43.0	22	—27.0	24	28.8	8.1	20.7	47.0	21	5.0	6
[illegible]rcer,*	Greenville— Thiel College,	1,000	30.087	30.811	29.295	19.1	48.0	17	—16.8	24	33.8	11.3	19.5	40.6	25	2.7	1
[illegible]ntgomery,	Pottstown,	150	. . . .	. . . .	. . . .	23.5	44.0	9	0.0	24	33.0	21.0	12.0	26.0	4	1.0	18
[illegible]rthampton,	Bethlehem,	360	. . . .	. . . .	. . . .	27.0	42.0	17	— 1.0	24	33.0	19.0	14.0	39.0	22	9.0	24
[illegible]rthumberland,	Shamokin,	733	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
[illegible]rry,	New Bloomfield,	400	. . . .	. . . .	. . . .	22.3	51.0	17	0.5	24	32.2	14.0	18.2	36.0	2	6.0	26
Philadelphia,*	Philadelphia,	117	30.180	30.800	29.450	28.2	51.0	5	2.0	24	35.9	23.1	12.8	22.7	5	5.0	19
Potter	Coudersport,	1,670	. . . .	. . . .	. . . .	17.8	44.0	12, 22	—27.0	24	25.5	8.8	16.7	51.0	21	4.0	17
Schuylkill,	Girardville,	1,000	30.214	30.776	29.845	23.1	41.0	17	— 4.0	24	30.0	15.2	14.8	22.0	21	8.0	17
Snyder,	Selinsgrove,	445	. . . .	. . . .	. . . .	24.8	46.0	17	— 4.0	24	32.7	11.8	20.9	28.0	14	2.0	19
Somerset,	Somerset,	2,250	. . . .	. . . .	. . . .	21.0	50.0	17	13.0	24	33.5	13.5	20.2	33.0	24	3.0	23
Sullivan,	Eagles Mere,	2,060	30.198	30.892	29.554	12.0	40.0	17	—17.0	24	23.2	8.8	14.4	29.0	23	3.0	23
Susquehanna,	Montrose,	1,656	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
[illegible]ioga,	Wellsboro',	1,327	30.093	30.841	29.389	18.4	54.0	17	20.0	24	30.2	10.2	20.0	33.1	26	3.2	14
[illegible]enango,	Franklin,	. . .	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Warren,	Columbus,	1,410	. . . .	. . . .	. . . .	14.4	42.0	15	—26.0	24	27.1	9.7	17.4	44.0	4	1.0	17
Wayne,	Honesdale,	1,000	. . . .	. . . .	. . . .	16.0	39.0	17, 18	15.0	24	26.6	6.3	20.3	34.0	8	6.0	19
Westmoreland,	Greensburg,	1,075	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
York,*	York,	385	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

*Observations taken at 8 A. M. and 8 P. M. †Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	Total snowfall during month.	Depth of snow on ground at end of month.	Number of days rainfall.	NUMBER OF DAYS Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Allegheny,*	Pittsburgh,	72.6	19.2	1.58	. . .	. . .	16	1	12	15	W	W	W
Beaver,	Rochester,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Bedford,	Charlesville,	72.5	15.9	1.53	3 80	. . .	10	4	10	14	NW	W	SW
Berks,*	Reading,	. . .	. . .	1.36	1.00	. . .	7	12	7	9	NW	NW	NW
Blair,†	Altoona,	69.8	21.5	1.24	. . .	. . .	9	. . .	. . .	. . .	. . .	. . .	. . .
Bradford,	Wysox,	81.3	15.2	1.73	14.00	6.00	8	6	10	12	NW	NW	NW
Bucks,	Quakertown,	83.8	15.3	2.38	1.69	. . .	11	6	12	10	NW	NW	NW
Butler,	Butler,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cambria,	Johnstown,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cameron,	Emporium,	. . .	. . .	1.61	13.35	7.00	8	3	14	11	W	W	W
Centre,	State College—Agricultural Experiment Station,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Chester,	West Chester,	70.0	17.8	2.48	3.50	1.00	12	12	8	8	W	W	W
Clarion,	Clarion—State Normal School,	84.3	15.0	2.10	. . .	. . .	. . .	. . .	. . .	. . .	SW	SW	SW
Clearfield,	Grampian Hills,	. . .	. . .	1.96	17.00	12.00	7	4	10	14	W	W	W
Clinton,	Lock Haven,	. . .	. . .	1.74	9.50	. . .	9	12	5	11	W	W	W
Columbia,	Catawissa,	76.3	20.8	1.61	6.50	. . .	9	10	8	10	N	NW	W
Crawford,	Meadville—Allegheny College,	. . .	. . .	2.85	9.75	1.00	11	9	8	11	W	W	W
Cumberland,	Carlisle,	69.0	19.0	1.68	4 25	. . .	11	4	12	12	W	W	W
Dauphin,*	Harrisburg,	. . .	. . .	1.48	. . .	. . .	. . .	9	5	14	NW	NW	NW
Delaware,	Swarthmore—Swarthmore College,	79.0	21.0	1.97	1.70	1.00	5	3	8	17	. .	. .	. .
Erie,*	Erie,	. . .	. . .	1.57	. . .	. . .	20	3	7	18	. .	. .	. .
Fayette,	Uniontown,	73.0	22.0	2.43	6.00	. . .	7	6	12	10	NW	NW	NW
Forest,	Tionesta,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Franklin,*	Chambersburg—Wilson Female College,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Fulton,	McConnellsburg,	80.0	20.7	1.65	2.50	. . .	6	8	9	11	N	NW	NW
Huntingdon,	Huntingdon—The Normal College,	. . .	. . .	.97	3.20	. . .	4	6	14	8	W	W	W
Indiana,	Indiana—State Normal School,	84.5	22.6	2.42	4.10	. . .	10	4	9	15	W	W	W
Lackawanna,	Scranton,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.											
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Lancaster	Lancaster—																
	Franklin and Marshal College,	413	30.164	30.815	29.457	26.4	44.0	3, 9	— 1.5	24	34.4	18.9	15.5	26.5	23	7.0	16
Lawrence,	New Castle,	932	. . . .	. . . .	. . . .	24.7	50.0	17	—11.0	24	32.7	14.5	18.2	37.0	5	5.0	27
Lebanon,	Lebanon,	480	30.167	30.847	29.471	25.8	44.8	22	0.0	24	34.2	19.2	15.0	32.4	23	4.1	18
Luzerne,	Drifton—																
	Drifton Hospital,	1,655	. . . .	. . . .	. . . .	18.7	47.0	. . . .	—13.0	. . . .	32.0	10.1	21.9	33.0	. . .	11.0	. . .
McKean,	Smethport,	1,500	. . . .	. . . .	. . . .	20.8	43.0	22	— 27.0	24	28.8	8.1	20.7	47.0	21	5.0	6
Mercer,*	Greenville—																
	Thiel College,	1,000	30.087	30 811	29 295	19.1	48.0	17	—16.8	24	33.8	11.3	19.5	40.6	25	2.7	1
Montgomery,	Pottstown,	150	. . . .	. . . .	. . . .	23.5	44 0	9	0.0	24	33.0	21.0	12.0	26.0	4	1.0	18
Northampton,	Bethlehem,	360	. . . .	. . . .	. . . .	27.0	42.0	17	- 1.0	24	33.0	19.0	14.0	39.0	22	9.0	24
Northumberland,	Shamokin,	733	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Perry,	New Bloomfield,	400	. . . .	. . . .	. . . .	22.3	51.0	17	0.5	24	32.2	14.0	18.2	36.0	2	6.0	28
Philadelphia,*	Philadelphia,	117	30.180	30.830	29.450	28.2	51.0	5	2.0	24	35.9	23.1	12.8	22.7	5	5.0	19
Potter	Coudersport,	1,670	. . . .	. . . .	. . . .	17.8	44.0	12, 22	—27.0	24	25.5	8.8	16.7	51.0	21	4.0	3
Schuylkill,	Girardville,	1,000	30.214	30.776	29.845	23 1	41.0	17	— 4.0	24	30.0	15.2	14.8	22.0	21	8.0	17
Snyder,	Selinsgrove,	445	. . . .	. . . .	. . . .	24.8	46.0	17	— 4.0	24	32.7	11.8	20.9	28.0	14	2.0	19
Somerset,	Somerset,	2,250	. . . .	. . . .	. . . .	21.0	50.0	17	-15.0	24	33.5	13.5	20.2	33.0	24	3.0	6
Sullivan,	Eagles Mere,	2,000	30.198	30.802	29.554	12.0	40.0	17	-17.0	24	23.2	8.8	14.4	29.0	23	3.0	3
Susquehanna,	Montrose,	1,656	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tioga,	Wellsboro',	1,327	30.093	30.841	29.369	18.4	54.0	17	20.0	24	30.2	10.2	20.0	33.1	26	3.2	14
Venango,	Franklin,	. . .	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Warren,	Columbus,	1,410	. . . .	. . . .	. . . .	14.4	42.0	15	—26.0	24	27.1	9.7	17.4	44.0	4	1.0	17
Wayne,	Honesdale,	1,000	. . . .	. . . .	. . . .	16.0	39.0	17, 18	—15.0	24	26.6	6.3	20.3	34.0	8	6.0	19
Westmoreland,	Greensburg,	1,075	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
York,*	York,	385	. . . .	. . . .	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

*Observations taken at 8 A. M. and 8 P. M. †Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	Total snowfall during month.	Depth of snow on ground at end of month.	Number of days rainfall.	NUMBER OF DAYS Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Allegheny,*	Pittsburgh,	72.6	19.2	1.58	....	....	16	1	12	15	W	W	W
Beaver,	Rochester,	....	....	....	....	....	....	....	....	....	....	....	....
Bedford,	Charlesville,	72.5	15.9	1.53	3.80	....	10	4	10	14	NW	W	SW
Berks,*	Reading,	....	....	1.36	1.00	....	7	12	7	9	NW	NW	NW
Blair,†	Altoona,	69.8	21.5	1.24	....	....	9	....	....	....	....	....	....
Bradford,	Wysox,	81.3	15.2	1.75	14.00	6.00	8	6	10	12	NW	NW	NW
Bucks,	Quakertown,	83.8	15.3	2.38	1.69	....	11	6	12	10	NW	NW	NW
Butler,	Butler,	....	....	....	....	....	....	....	....	....	....	....	....
Cambria,	Johnstown,	....	....	....	....	....	....	....	....	....	....	....	....
Cameron,	Emporium,	....	....	1.61	13.35	7.00	8	3	14	11	W	W	W
Centre,	State College—Agricultural Experiment Station,	....	....	....	....	....	....	....	....	....	....	....	....
Chester,	West Chester,	70.0	17.8	2.48	3.50	1.00	12	12	8	8	W	W	W
Clarion,	Clarion—State Normal School,	84.3	15.0	2.10	....	....	7	....	....	....	SW	SW	SW
Clearfield,	Grampian Hills,	....	....	1.96	17.00	12.00	7	4	10	14	W	W	W
Clinton,	Lock Haven,	....	....	1.74	9.50	....	9	12	5	11	W	W	W
Columbia,	Catawissa,	76.3	20.8	1.61	6.50	....	9	10	8	10	N	NW	W
Crawford,	Meadville—Allegheny College,	....	....	2.85	9.75	1.00	11	9	8	11	W	W	W
Cumberland,	Carlisle,	69.0	19.0	1.68	4.25	....	11	4	12	12	W	W	W
Dauphin,*	Harrisburg,	....	....	1.48	....	....	9	9	5	14	NW	NW	NW
Delaware,	Swarthmore—Swarthmore College,	79.0	21.0	1.97	1.70	1.00	5	3	8	17	....	....	....
Erie,*	Erie,	....	....	1.57	....	....	20	3	7	18	....	....	....
Fayette,	Uniontown,	73.0	22.0	2.43	6.00	....	7	6	12	10	NW	NW	NW
Forest,	Tionesta,	....	....	....	....	....	....	....	....	....	....	....	....
Franklin,*	Chambersburg—Wilson Female College,	....	....	....	....	....	....	....	....	....	....	....	....
Fulton,	McConnellsburg,	80.0	20.7	1.65	2.50	....	6	8	9	11	N	NW	NW
Huntingdon,	Huntingdon—The Normal College,	....	....	.97	3.20	....	4	6	14	8	W	W	W
Indiana,	Indiana—State Normal School,	84.5	22.6	2.42	4.10	....	10	4	9	15	W	W	W
Lackawanna,	Scranton,	....	....	....	....	....	....	....	....	....	....	....	....

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION: Total inches.	PRECIPITATION: Total snowfall during month.	PRECIPITATION: Depth of snow on ground at end of month.	PRECIPITATION: Number of days rain-fall.	NUMBER OF DAYS: Clear.	NUMBER OF DAYS: Fair.	NUMBER OF DAYS: Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Lancaster,	Lancaster—												
	Franklin and Marshall College,	70.0	17.4	2.16	4.00	....	8	7	9	12	W	W	W
Lebanon,	New Castle,	88.2	20.2	3.33	10.75	....	6	7	7	14	NW	NW	NW
Luzerne,	Lebanon,	75.7	19.0	1.85	5.50	....	11	6	13	9	SW	NW	NE
	Drifton—												
McKean,	Drifton Hospital,	....	....	1.46	8.50	....	5	....	....	....	....	....	....
Mercer,*	Smethport,	....	....	2.72	19.75	....	12	3	7	18	SW	SW	SW
	Greenville—												
Montgomery,	Thiel College,	89.7	16.0	1.18	14.00	....	13	5	16	7	NW	NW	SW
Northampton,	Pottstown,	69.0	15.0	1.92	2.00	....	6	13	6	9	NW	W	W
Northumberland,	Bethlehem,	71.0	20.0	1.94	4.00	....	6	10	5	13	W	NW	W
Perry,	Shamokin,	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia,*	New Bloomfield,	....	....	1.24	9.30	0.50	7	13	7	8	W	W	W
Potter,	Philadelphia,	68.6	18.6	2.00	3.40	....	10	3	12	13	NW	NW	NW
Schuylkill,	Coudersport,	78.2	12.1	1.90	16.50	8.00	2	5	10	13	W	W	W
Snyder,	Girardville,	....	....	1.66	12.00	3.00	9	12	7	9	NW	NW	NW
Somerset,	Selinsgrove,	80.0	19.0	1.52	2 80	1.00	4	12	9	7	SW	SW	SW
Sullivan,	Somerset,	83.0	18.9	3.13	15.70	3.00	15	6	12	10	NW	NW	NW
Susquehanna,	Eagles Mere,	61.7	6.5	3.82	28.50	23.00	9	6	10	10	SW	SW	SW
Tioga,	Montrose,	....	....	....	....	....	....	....	....	....	....	....	....
Venango,	Wellsboro',	80.5	13.5	2.98	17.55	12.50	15	5	7	18	SW	W	W
Warren,	Franklin,	....	....	....	....	....	....	....	....	....	....	....	....
Wayne,	Columbus,	....	....	1.53	....	4.00	13	4	....	17	SW	SW	SW
Wayne,	Honesdale,	....	....	2.10	....	....	11	....	....	....	....	....	....
Westmoreland,	Greensburg,	....	....	....	....	....	....	....	....	....	....	....	....
York,*	York,	....	....	....	....	....	....	....	....	....	....	....	....

*Observations taken at 8 A. M. and 8 P. M. †Observations taken at 12 noon.

PRECIPITATION FOR FEBRUARY, 1889.

	Erie.	Greenville.	New Castle.	Columbus.	Pittsburgh.	Uniontown.	Indiana.	Somerset.	Grampian Hills.	Emporium.	Phillipsburg.	Huntingdon.	Hollidaysburg.	Altoona.	Charleeville.	McConnellsburg.	Lock Haven.	New Bloomfield.	Carlisle.	Wellsboro.	Harrisburg.	Bellnapgrove.	Wyoxx.	Kanjes Mere.	Catawissa.
1	.02			.06	.02		.01	.15		.04	.14									.05					
2	.06			.03	.03			.06	.12		.01				.01					.05					
3	.08				.01	.14		.01			.01				.02					.02	.01				
4		.02	2.00	.16	.14		.05	.05		.20	.02		.53	.14	.02		.55	.20		.02	.06			.74	.04
5	.14	.01	.15	.14	.01	.12	.10	.45	.28	.06	.03			.06	.07	.10	.16	.10	.07	.12					
6	.05	.14		.23	.01		.20	.09		.10	.13			.02	.02	.15	.05	.06	.08	.05					
7	.06	.10		.30	.09		.15	.22	.25		.02	.34	.53	.14	.08		.10	.42	.10	.27	.08	.21	.19		
8	.05	.14	.40	.08	.05					.09	.11		.05	.04	.01				.05	.15			.05		
9	.06	.17		.04	.01	.16		.07			.01														
10	.14		.15		.35	.70	.60	.60	.44	.15	.15	.09	.68		.51	.65	.02	.02	.15	.20	.30	.74	.30	.46	.54
11				.15	.02	.76	.10	.15			.40	.43	.65	.42	.34	.24	.47	.35	.40	.05	.22	.15	.33	.38	.01
12	.06	.30	.15		.67		.15	.76	.66	.74	.60			.44	.42	.44	.20		.60	1.52	.71		.10		.24
13				.06				.07			.05			.03										.12	
14	.03	.05	.30		.03		.07	.60			.02								.05	.05					
15	.01	.01	.15	.11	.05	.37	.05	.15	.12	.11	.06	.11		.06		.07	.10	.06	.10	.03	.01		.37	.34	.15
16	.05	.02	.33	.13		.57	.05	.15	.12	.06	.01						.05	.03	.05	.10	.14	.04	.04	.46	.10
17	.01	.21																							.17
18	.02	.01																							
19																									
20																									
21																									
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28																									
29																									
30																									
31																									
	1.57	1.18	3.33	1.53	1.58	2.43	2.42	3.13	1.96	1.61	1.87	.97	1.91	1.24	1.53	1.63	1.74	1.24	1.68	2.98	1.48	1.52	1.73	3.87	1.61

PRECIPITATION FOR FEBRUARY, 1889—*Continued.*

	Girardville.	Lebanon.	Lancaster.	Drifton.	Reading.	Bethlehem.	Pottstown.	West Chester.	Westtown.	Coatesville.	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Coudersport.	Selsholtzville.	Frederick.	Ottsville.	Smith's Corner.	Doylestown.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.
1.								.01	.61						.30									
2.																								
3.		.01									.01							.13	.03					.02
4.		.01						.01												.14				
5.	.28	.20	.10		.24	.25	.15	.14	.04	.20	.20	.23		.08		.33	.19	.22	.20		.36	.12	.01	.19
6.					.02			.05		.02		.05	.12					.27				.02	.14	
7.																								
8.	.09			.27		.02					.23				.20		.06							
9.		.03										.07			.30				.06					.01
10.																								
11.	.12	.13	.11		.03		.05	14		10	.18	.07		.14	.10	.23	10	17		.22	.11	.17	.20	.19
12.		.10				.08	.07	03	01	.07	.04	.04			.30									
13.																								
14.																								
15.																								
16.	.63	.67	.60	.45	75	.83	.80	98	88	.62	.65	.92	.98	.93		.29	70	.96	95	.87	.48	88		.96
17.	.06	.06	.21	.26	03			.05		.04	.07	.10	.02	.01			42							
18.	.31	.50	.39		40	.56	.45	.61	50	.40	.34	.57	.53	.42	.60	1.02		.48	50	.52	.69	50	29	.58
19.																								
20.																								
21.																								
22.				.14																				
23.	.03													.05										
24.	.04																							
25.		.01	50					.07		10	.02	.04		.01										
26.	.05													.05		.01	03	.19				.06	07	.01
27.	.11	.22	24	.34	.15	.22	.40	.32		36	.27	.21		.28	.10	.25								
28.			01					.05	.26		.06	.08	.27	.03			28	.25	.26	30	03	.28	43	.24
29.																								
30.																								
31.																								
	1.06	1.85	2.16	1.46	1.62	1.94	1.92	2.46	1.72	1.85	2.10	2.38	1.92	2.00	1.90	2.13	1.84	2.67	2.22	2.05	1.63	2.03	2.19	2.20

MARCH, 1889.

TEMPERATURE.

The mean temperature for March, 1889, 38°.9, is from 2° to 3° above the normal, and 7°.8 above that of March, 1888.

The mean, determined from the daily maxima and minima, is 39°.0.

The following stations report the highest average daily temperatures: New Castle, 45°.3; Selinsgrove, 44°.0; Indiana, 43°.2, and Pottstown, 43°.0. The highest temperatures noted on any one day were Columbus, 76°.0; Pittsburgh, 70°.0, and Rimersburg, 70°.0. The lowest were Columbus, 4°.0; Somerset, 9°.0; New Castle, 9°.0, and Clarion, 9°.0. The coldest day of the month was on the 30th, but the low temperatures that generally occur in March were not reached. The entire month has been characterized by mildness.

BAROMETER.

The mean barometer, 29.95, is about .07 below the average. The highest pressure occurred on the 1st, and the lowest on the 7th.

PRECIPITATION.

The average precipitation (rain and melted snow), 2.90 inches, is a deficiency of a little over one-half inch. The distribution was uneven. The largest totals reported for the month were West Chester, 5.44 inches; McConnellsburg, 4.76 inches; Coatesville, 4.49 inches, and Ottsville, 4.42 inches. Several stations report less than 2 inches.

The greatest total snowfall in inches were Charlesville, 11.50; Eagles Mere, 9.60; Girardville, 8.00, and Somerset, 7. 80.

Very few stations reported snow on the ground at the end of the month.

WIND AND WEATHER.

The prevailing wind direction was from the northwest.

The weather for March was unusually fine. Notwithstanding the lack of snow, winter grain appears to have been injured very little. Frosts were numerous, but caused little damage.

Average number.—Rainy days, 9; clear days, 10; fair days, 8; cloudy days, 13.

MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for March, 1889.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.										
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Allegheny.*	Pittsburgh,	847	29.985	30.390	29.470	41.4	70.0	31	23.0	30	51.3	35.1	16.2	36.0	31	5.0	19
Beaver,	Rochester,	821															
Bedford,	Charlesville,	1,300				39.2	67.5	31	19.5	12	50.4	28.8	21.6	41.0	13	4.5	18
Berks,*	Reading,	304	29.929	30.489	29.380	38.9	69.0	14	22.5	30	51.3	31.8	19.5	40.0	14	4.0	4
Blair,†	Altoona,	1,181				42.7	65.0	19	22.0	30	51.5	33.9	17.6	34.0	30	9.0	5
Bradford,	Wysox,	718				36.2	62.7	24	21.0	30	44.2	29.0	15.2	38.0	24	3.5	5
Bucks,	Quakertown,	536	29.930	30.510	29.330	38.5	63.7	24	19.5	26	48.4	29.7	18.7	35.5	13	7.2	4
Butler,	Butler,																
Cambria,	Johnstown,	1,184															
Cameron,	Emporium,	1,030				40.0	65.0	18	11.0	30	49.6	26.6	23.0	38.0	16	9.0	4
Centre,	State College—Agricultural Experiment Station,	1,191															
Chester,	West Chester,	455	29.918	30.508	29.341	40.1	68.5	18, 27	22.0	30, 31	40.	32.	8.3	31.0	31	5.0	21
Clarion,	Clarion—State Normal School,	1,530				37.7	67.0	17	9.0	30	46.	28.7	18.1	36.5	26	5.0	4
Clearfield,	Grampian Hills,	1,450				36.6	66.0	18	12.0	30	45.4	30.0	15.4	32.0	20	2.0	5
Clinton,	Lock Haven,	560				39.2	69.0	17	19.0	26	49.0	28.0	21.0	43.0	17	6.0	10
Columbia,	Catawissa,	491				40.7	65.5	24	23.0	30	50.5	33.5	17.0	32.0	18	5.0	4
Crawford,	Meadville—Allegheny College,	1,050															
Cumberland,	Carlisle,	480				41.3	68.5	24	25.0	18, 30	51 1	34.4	16.7	36.5	26	2.0	19
Dauphin,*	Harrisburg,	361	29.959	30.540	29.400	40.0	62.0	13, 24	23.0	30	47	34.0	13.7	28.0	13	4.0	20
Delaware,	Swarthmore—Swarthmore College,	190	29.967	30.431	29.572	40.3	64.9	27	24.0	30	49.1	32.8	16.3	33.8	27	5.8	19
Erie,*	Erie,	681	29.980	30.450	29.470	34.0	58.0	27	20.0	11	40.0	29.0	11.0	24.0	15	3.0	8
Fayette,	Uniontown,	1,000	29.960	30.364	29.510	41.5	68.0	18	11.0	11, 30	50.7	29.7	21.0	36.0	17	7.0	5
Forest,	Tionesta,	1,058															
Fulton,	McConnellsburg,	875				40.0	66.0	24	22.0	30	51.9	31	20.8	37.0	13	5.0	21
Huntingdon,	Huntingdon—The Normal College,	650				38.9	65.0	18	19.0	25	47 5	29.0	18.5	44.0	18	2.0	10
Indiana,	Indiana—State Normal School,	1,350				43.2	69.0	18	17.0	11	50.8	31.9	18.9	33.0	26	6.0	21
Lackawanna,	Scranton,	750															
Lancaster,	Lancaster—Franklin and Marshall College,	413	29.925	30.511	29.340	40.4	64.0	24	21.0	26	49.5	31.8	17.7	32.	18	5.5	3

Lawrence	New Castle	932				45.8	69.0	17	9.0	30	51.0	25.0	26.	40.0	17	7.0	21		
Lebanon	Lebanon	480	29.916	30.523	29.347	38.4	65.0	13	24.1	30	50.0	32.4	17.	35.2	13	3.5	3		
Luzerne	Drifton—																		
	Drifton Hospital	1,655				35.8	61.0	13, 27	15.0	30	47.8	28.8	19.	35.0		8.0			
McKean	Smethport	1,500																	
Mercer*	Greenville—																		
	Thiel College	1,000																	
Montgomery	Pottstown	150				43.0	68.0	13	24.0	30	50.6	34.6	16.	36.0	13	4.0	19		
Northampton	Bethlehem	360																	
Northumberland	Shamokin	733																	
Perry	New Bloomfield	400				38.9	66.0	17	19.0	26	48.7	29.9	18	38.0	18	2.0	19		
Philadelphia*	Philadelphia	117	29.941	30.530	29.360	41.1	66.0	27	25.0	30	49.4	35.	14	31.0	27	5.	20		
Potter	Coudersport	1,670																	
Schuylkill	Girardville	1,000	29.955	30.469	29.426	38.8	61.0	18	19.0	30	46.5	29.9	16.6	40.0	31	6.0			
Snyder	Selinsgrove	445				44.0	62.0	13	24.0	30	49.3	39.7	9.	28.0	17	3.0	20		
Somerset	Somerset	2,250				35.3	65.0	17, 31	9.0	30	47.2	21.	26.	36.0	17	3.0	5		
Sullivan	Eagles Mere	2,060	30.011	30.559	29.386	33 4	56.0	24	10.0	30	40.3	25.	14.	25.0	25	3.	21		
Tioga	Wellsboro'	1,327	29.923	30.406	29.307	35.7	65.0	17	18.0	30	45.6	28.	16.	36.4	30	5.	5		
Venango	Franklin																		
Warren	Columbus	1,410	29.992	30.560	29.589	36.5	76.0	17	4.0	11	47.0	26.0	21.	46.0	17	0	8		
Wayne	Honesdale	1,000				34.2	56.0	24	15.0	12	41.6	26.8	14.	30.0	12	4.	20		
York*	York	385																	

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION	Relative humidity.	Dew point.	PRECIPITATION: Total inches.	PRECIPITATION: Total snowfall during month	PRECIPITATION: Number of days rainfall	NUMBER OF DAYS: Clear	NUMBER OF DAYS: Fair.	NUMBER OF DAYS: Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Allegheny,*	Pittsburgh,	63	29.6	2.32	....	15	6	10	15	NW	NW	W
Beaver,	Rochester,	....	....	....	....	....	....	....	....	....	....	....
Bedford,	Charlesville,	77.3	28.4	4.36	11 50	7	....	....	....	NW	NW	NW
Berks,*	Reading,	86.6	34.7	3.71	8.50	9	11	5	15	NW	NW	SW
Blair,†	Altoona,	60.5	30.0	2.37	....	9	....	....	....	NW	....	....
Bradford,	Wysox,	79.	30.0	1.73	4.50	8	11	3	17	....	NW	NW
Bucks,	Quakertown,	74	30.0	3.47	8 20	10	9	6	16	NE	NE	NE
Butler,	Butler,	....	....	....	....	....	....	....	....	....	....	....
Cambria,	Johnstown,	....	....	....	....	....	....	....	....	....	....	....
Cameron,	Emporium,	68.0	30.	1.44	3.45	8	11	8	12	W	W	W
Centre,	State College— Agricultural Experiment Station,	....	....	....	....	....	....	....	....	....	....	....
Chester,	West Chester,	66.0	29.	5.44	3.00	15	11	8	12	NW	NW	NW
Clarion,	Clarion— State Normal School,	80.0	31	1.91	....	4	10	8	13	SW	SW	SW
Clearfield,	Grampian Hills,	....	....	2.57	7.00	12	12	5	14	W	W	W
Clinton,	Lock Haven,	....	....	2.63	3.50	8	11	6	14	W	W	W
Columbia,	Catawissa,	....	....	2.99	3.50	7	10	9	12	N	N	N
Crawford	Meadville— Allegheny College,	....	....	....	....	....	....	....	....	....	....	....
Cumberland,	Carlisle,	71.0	31.8	1.91	....	9	9	8	14	N	W	SW
Dauphin,*	Harrisburg,	75.4	32.2	3.26	....	9	7	9	15	NW	NW	NW
Delaware,	Swarthmore Swarthmore College,	74.6	31.9	3.43	....	10	4	10	17	NW	NW	NW
Erie,*	Erie,	78.0	27.0	1.73	4.00	10	11	12	8	NE	NE	NE
Fayette,	Uniontown,	72.0	....	3.60	7.50	10	10	10	10	....	....	....
Forest,	Tionesta,	....	....	....	....	....	....	....	....	....	....	....
Fulton,	McConnellsburg,	75.7	31.2	4.76	....	10	11	9	11	NW	NW	W
Huntingdon,	Huntingdon— The Normal College,	....	....	3.27	....	5	15	3	13	W	W	W
Indiana,	Indiana State Normal School,	76.5	37.8	1.47	3.25	10	8	11	12	W	W	W

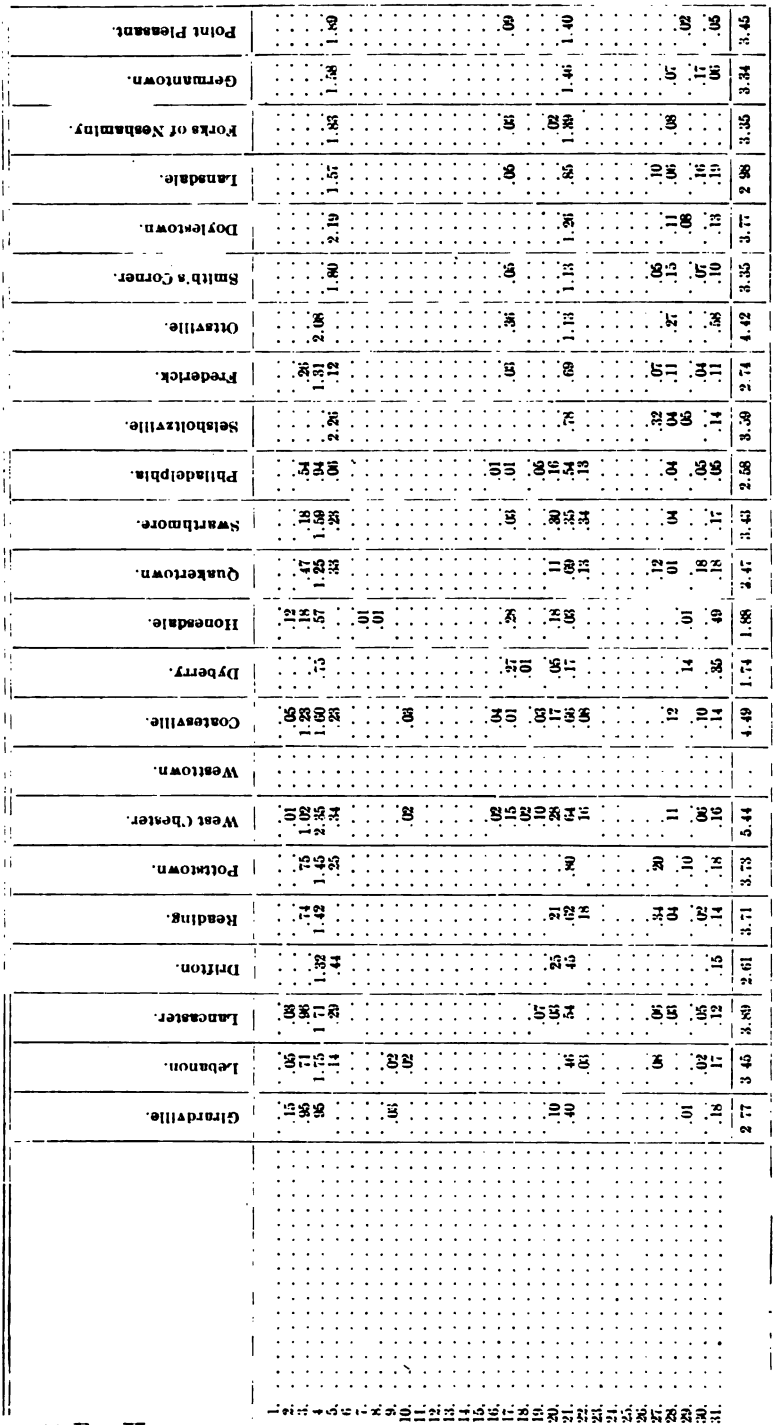
Lackawanna	Scranton											
Lancaster	Lancaster											
	Franklin and Marshall College	65.5	28.7	3.89	3.45	10	8	10	13	NW	W	NW
Lawrence	New Castle	58.2	41.5	2.73	2.50	5	12	4	15	NW	NW	NW
Lebanon	Lebanon	72.4	30.0	3.45	3.70	11				NE	W	NW
Luzerne	Drifton—											
	Drifton Hospital			2 61		5	6	14	11			
McKean	Smethport											
Mercer*	Greenville—											
	Thiel College											
Montgomery	Pottstown	7	34 5	3.73	1.00	7	14	6	11	NW	W	W
Northampton	Bethlehem											
Northumberland	Shamokin											
Perry	New Bloomfield			3.91	1.00	8	8	6	17	W	W	W
Philadelphia*	Philadelphia	67	30.6	2 58	50	12	11	5	15	NW	NW	NW
Potter	Coudersport											
Schuylkill	Girardville			2.77	8.00	8	16	6	9	NE	NW	NW
Snyder	Selinsgrove	77.0	33.	2 60	2.50	5	12	8	11	NW	NW	NW
Somerset	Somerset	89.	29.	2 52	7.80	14	11	7	13	NW	NW	NW
Sullivan	Eagles Mere	64 6	22.	1.85	9 60	6	8	9	14	SW	NE	NE
Tioga	Wellsboro'	80.6	26.3	3.24	3.00	8	10	7	14	N	N	N
Venango	Franklin											
Warren	Columbus			1.63		9	10	9	12	NE	SW	SW
Wayne	Honesdale			1.88		10						
York*	York											

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

PRECIPITATION FOR MARCH, 1889.

	Erie	New Castle.	Columbus.	Pittsburgh	Uniontown.	Clarion.	Indiana.	Somerset.	Grampian Hills.	Emporium.	Phillipsburg.	Huntingdon.	Hollidaysburg.	Altoona.	McConnellsburg.	Lock Haven.	New Bloomfield.	Carlisle.	Wellsboro'.	Harrisburg.	Selinsgrove.	Wyoox.	Eagles Mere.	Catawissa.
1.	.04		.22	.05	.05	.75	.02	.10	.22	.25	.06		.18	.02	.21	.60	.35		.10	.06	.16	.17	.73	.03
2.	.17		.38	.34	.33	.07	.45	.20	.45	.04	.53	.60	.23	.47	.53	.32	.60		1.54	.66	.84	.30	.28	.50
3.	.38	.90		.81	.60		.20	.07	.73	.38	.72	1.31	.69	.95	1.77	.73	2.20	1.40	.60	2.13	1.22	.49		1.64
4.				.11	.05		.10	.60		.33	.16	.14	1.06	.08	.86				.20	.06	.63			
5.			.02	.01	.03		.05	.15	.03		.01		.30									.02		
6.			.04	.02	.05		.10		.08		.02											.04		
7.	.06	.20		.01	.05			.05	.08		.05													
8.	.20			.11	.05			.14																
9.				.01																				
10.				.01																				
11.																								
12.																								
13.																								
14.																								
15.																								
16.				.16	.31		.02	.19	.08		.05		.38	.14	.57	.05	.20	.01	.07	.07			.80	
17.				.10	.66	.28	.10	.29	.15	.06	.20	.02	.36	.13	.08	.24	.04	.10	.04	.04				
18.				.02	.15		.40	.32	.30	.07	.33		.07	.14	.15	.21	.25	.30	.40	.17				
19.								.06									.12	.02		.03				
20.				.04	.40			.08	.05	.06	.01		.13	.02	.09				.10			.50	.19	.20
21.			.03	.13	.22	.81		.15	.05	.06	.06	.50	.50	.42	.08	.01	.25	.08	.05	.04	.25		.22	.22
22.	.10	.05	.15	.01	.01			.12	.60	.25	.07		.60			.47			.25					.05
23.	.04	1.25	.73	.30																				.35
24.																								
25.																								
26.																								
27.																								
28.																								
29.																								
30.																								
31.																								
	1.73	2.73	1.63	2.32	3.00	1.91	1.47	2.52	2.57	1.44	2.27	3.17	3.69	2.37	4.76	2.63	3.91	1.91	3.24	3.36	2.60	1.73	1.85	2.99

PRECIPITATION FOR MARCH, 1889—*Continued.*



	Girardville.	Lebanon.	Lancaster.	Dilton.	Reading.	Pottstown.	West Chester.	Westtown.	Coatesville.	Dyberry.	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Selinsgrove.	Fredericksburg.	Ottsville.	Smith's Corner.	Doylestown.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.
1	.15	.05	.08		.74	.75	.01		.05		.12												
2	.95	.71	.96		1.42	1.45	1.02		1.23	.75	.18	.47	.18	.54									
3	.95	1.75	1.71	1.32		.25	2.35		1.60		.57	1.25	1.59	.04		1.31	2.06	1.80	2.19	1.57	1.85	1.58	1.89
4		.14	.20	.44			.34		.23			.33	.23	.06	2.26	.12							
5																							
6																							
7		.02					.02		.03		.01												
8	.05	.02									.01												
9																							
10																							
11							.02		.04	.29				.01		.01	.36	.05	.06	.05	.05		.09
12		.02	.07		.21		.15		.01	.27				.06		.05							
13			.03	.25	.02		.02		.03	.01	.18	.11	.30	.16									
14		.46	.54	.45	.18	.80	.10		.17	.05	.03	.13	.33	.54	.78	.69	1.13	1.13	1.36	.85	1.39	1.46	1.40
15		.03					.04		.06	.11			.34	.13									
16																							
17																							
18																							
19																							
20		.06	.06		.34	.20	.11		.12	.14	.01	.12	.04	.04	.32	.07	.27	.05	.11	.10	.08	.07	
21			.05		.04	.10	.06					.01			.04	.11		.15	.08	.06			
22			.05		.02	.18	.16		.10	.36	.49	.18	.17	.05	.14	.04	.38	.05	.13	.16	.16	.17	.02
23			.12	.15	.14	.16	.06		.14	.05		.16		.06		.11		.10		.11	.10	.06	.05
24																							
25																							
26																							
27																							
28																							
29																							
30																							
31																							
	2.77	3.45	3.89	2.61	3.71	3.73	5.44		4.49	1.74	1.88	2.47	3.43	2.58	3.50	2.74	4.42	3.35	3.77	2.98	3.35	3.34	3.45

APRIL, 1889.

TEMPERATURE.

The average temperature of the state for April, 1889, was 48°.7, which is 2°.2 above that of April, 1888, 46°.5, which is about normal. Determined from the mean of the daily maximum and minimum temperature, it was 49°.7, which is one degree higher.

The warmest period of the month was during the 19th and 20th, when the following temperatures were noted: Carlisle, 88°; Hollidaysburg, 84°; Emporium, 84°; Grampian Hills, 84°: Uniontown, 84°, and New Castle, 84°. The lowest temperatures were Charlesville, 14°; Somerset, 14°, and Uniontown, 17°. These occurred on the 7th.

Stations reporting the highest monthly means for the state during April were Selinsgrove, 52°.8; Swarthmore, 52°.4; Bethlehem, 52°.4, and Carlisle, 52°.3. The lowest were Eagles Mere, 42°.3; Greenville, 44°.1; Wellsboro', 44°.2; Erie, 45°.0; Somerset, 45°.2, and Honesdale, 45°.2.

BAROMETER.

The mean barometric pressure, 29.99, is very nearly normal. The highest occurred on the 7th and 23d, and the lowest, 29.3, on the 27th. The latter was attended by heavy rains.

PRECIPITATION.

The precipitation averaged 4.50 inches, with a decided irregularity in its distribution. The greatest totals in inches were Wellsboro', 8.15; Girardville, 7.23, and Coatesville, 7.08. Most of the precipitation for the month occurred from the 24th to the 29th, inclusive. Only a few stations report snow in measurable quantities. The following are notable exceptions: Charlesville, 5.20 inches; Rimersburg, 9 inches, Grampian Hills, 5 inches: McConnellsburg, 12 inches; Somerset, 12.50 inches, and Columbus, 6 inches. These amounts fell on the 6th.

WIND AND WEATHER.

The prevailing direction of wind was from the west. No violent wind storm of a general character pased over the state. The latter part of the month was characterized by heavy rain storms. Numerous frosts occurred without seriously damaging vegetation.

At the end of the month, grain, grass, fruits and foliage were more advanced than usual at this season. Notwithstanding the absence of snow during the winter months, grain was not materially injured by freezing out.

Average number.—Rainy days, 11; clear days, 11; fair days, 8; cloudy days, 11.

MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for April, 1889.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.											
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Allegheny.*	Pittsburgh	847	29.985	30.480	29.450	50.8	83.0	19	25.0	6	61.2	43.5	17.7	38.0	23	3.0	28
Beaver	Rochester	821															
Bedford	Charlesville	1,300				49.5	79.5	19	14.0	7	61.3	40.5	20.8	39.5	23	3.5	27
Berks.*	Reading	304	30.001	30.408	29.536	49.4	48.0	19	27.0	14	62.7	40 8	21.9	43.0	11	6.0	26
Blair,†	Altoona	1,181				54.3	82.0	20	47 0	7	62.5	42.2	20.3	35.0	22	8.0	29
Bradford	Wysox	718				47.0	81.0	19	22.0	23	57.9	36.4	21.5	41.0	24	5.0	4
Bucks	Quakertown	536	30.029	30.490	29.380	49.7	79.0	20	24.0	6	61.3	38.6	22.7	43.8	11	6.3	27
Cambria	Johnstown	1,184															
Cameron	Emporium	1,060				51.6	84.0	19	21.0	8	62.1	34.0	28.1	47.0	26	11.0	30
Centre	State College – Agricultural Experiment Station	1,191	29.988	30.493	29.335	49.0	81.0	21	25.0	14	58.2	40.7	17.5	37.0	11	7.0	26
Chester	West Chester	455	29.970	30.467	29.238	51.2	77.0	20, 21	30.0	14	61.1	42.2	18.9	32.5	11	4.0	27
Clarion	Clarion – State Normal School	1,530				47 2	79.5	19	21.0	14	58.5	33.9	14.6	46.0	23	6.0	28
Clearfield	Grampian Hills	1,450				47.8	84.0	19	26.0	5	58.0	43.3	14.7	40.0	23	2.0	29
Clinton	Lock Haven	560				50.5	85.0	19	26.0	14	60.0	37.0	23.2	41.0	19	4.0	26
Columbia	Catawissa	491				51.3	82.0	20	24.0	7, 8	63.0	41.7	21 3	37.0	11	5.0	25
Crawford	Meadville – Allegheny College	1,050															
Cumberland	Carlisle	480				52.3	88.0	20	35.0	7	63.0	45.9	17.1	35.0	21	3.0	25
Dauphin.*	Harrisburg	361	29.631	35.470	39.000	50.6	80.0	20	34.0	5, 14	60.2	43.3	16.9	31.0	11	5.0	25
Delaware	Swarthmore – Swarthmore College	190				52.4	77.0	21	29.8	5	63.5	43.1	20.4	38.1	11	6.8	26
Erie.*	Erie	681	30.010	30.540	29.410	45.0	83.0	19	28.0	6	32.0	38.0	14.0	36.0	23	3 0	1
Fayette	Uniontown	1,000	29.984	30.354	29.435	50.8	84.0	20	17.0	7	61.6	38.4	23.2	40.0	24	2.0	16
Forest	Tionesta	1,058															
Fulton	McConnellsburg	875				51.5	82.0	20	25.0	7	63.7	40.9	22.8	38.0	11	7.0	27
Huntingdon	Huntingdon – The Normal College	650				50.0	81.0	19	26.0	23, 24	60.9	39.4	21.5	48.0	11	5.0	26, 28
Indiana	Indiana – State Normal School	1,350				62.1	82.0	6	38.0	2, 25	65 5	57.5	8.0	16.0	23	3.0	11
Lackawanna	Scranton	750															
Lancaster	Lancaster – Franklin and Marshall College	413	29.967	30.447	29.259	51.7	81.5	20	28.0	14	61.8	40.8	21.0	40.5	11	6.5	5
Lawrence	New Castle	932				51.1	84.0	19	21.0	6	60.0	35.0	25.0	46.0	23	7.0	1, 28

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.										
							MAXIMUM.		MINIMUM.				DAILY RANGE.			
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date	Lowest.	Date	Mean of maximum.	Mean of minimum	Mean.	Greatest.	Date	Least.	Date.
Lebanon	Myerstown	474	29.917	30.415	29.225	50.0	82.0	20	27.8	5	63.0	41 0	21.	38.7	19	6.2	26
Luzerne	Drifton—																
	Drifton Hospital	1,655				47.1	76.0	21	11.0	28	60.9	37.6	23.	32.0	16	11.0	28
McKean	Smethport	1,500															
Mercer,*	Greenville—																
	Thiel College	1,000	29.932	30.468	29.362	44.1	82.0	19	23.3	6	58.4	35	23	45.*	23	4.0	28
Montgomery	Pottstown	150				51 0	79.0	19	32 0	14	62.0	44.	18.0	43.0		2.0	26
Northampton	Bethlehem	300				52 4	82.0	20	22.0	5	62.7	42..	20.5	39.0	..	6 0	26
Northumberland	Shamokin	733															
Perry	New Bloomfield	400				50.1	83.0	20	27 0	16	62.3	37.0	25.3	42.0	11	7.0	28
Philadelphia,*	Philadelphia	117	29.984	30.490	29.270	51 6	78.0	21	34.0	14	61.6	44.8	16.8	29.0	11	5 0	27
Potter	Coudersport	1,670				47.1	78.0	19	19.0	6, 22	58.0	30.0	28 0	48.0	18	5.0	28
Schuylkill	Girardville	1,000	29.980	30.388	29.354	49 8	78.0	20	23.0	8	59.1	38.5	20.6	37.0	8, 11	6.0	25, 27
Snyder	Selinsgrove	445				52.8	80.0	20	32.0	5	60.0	44.8	15.2	33.0	11	6.0	25
Somerset	Somerset	2,250				45 2	72.0	24	14.0	7	63 2	27.2	36.0	38.0	12	5.0	27
Sullivan	Eagles Mere	2,060	28 989	30.507	29.356	42.3	74.0	20	24.0	14	52.7	34.9	17.8	32.0	9, 18	2.0	1
Tioga	Wellsboro'	1,327	29.990	30.374	29.316	44.2	80.0	19	22.0	23	55.9	35.1	20.8	34.4	19	6.0	29
Warren	Columbus	1,410				45 5	82.0	19	29.0	14	58.3	32.7	25.6	52.0	23	4 0	30
Wayne	Honesdale	1,000				45 2	77.0	20	22.0	23	55.1	35.3	19.8	40.0	11	4.0	28
York,*	York	385	30.020	30.371	29.371	50.2	82.0	20	31.5	14	63.1	41.3	21.8	40.0	11	5.0	13

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches	Total snowfall during month.	Number of days rainfall.	NUMBER OF DAYS Clear	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Allegheny.*	Pittsburgh.	63.5	37.8	3.62	. . . .	13	6	12	12	NW	NW	NW
Beaver.	Rochester.	. . .	. . .	. . . .	. . . .	. .	. .	. .	. .	. .	. .	. .
Bedford.	Charlesville.	69.2	38.6	4.76	5 20	12	9	11	10	W	W	W
Berks.*	Reading.	80.0	42.2	6.33	. . . .	13	12	6	12	NW	NW	SW
Blair.†	Altoona.	58.2	40.0	3.44	. . . .	12	. .	. .	. .	. .	. .	. .
Bradford.	Wysox.	75.0	40.0	3 78	. . . .	11	9	4	17	NW	NW	NW
Bucks.	Quakertown.	74.0	40.6	4.83	. . . .	14	8	11	11	NE	NE	N
Cambria.	Johnstown.	. . .	. . .	. . . .	. . . .	. .	. .	. .	. .	. .	. .	. .
Cameron.	Emporium.	65.4	39.2	3.66	. . . .	10	12	7	11	W	W	W
Centre.	State College— Agricultural Experiment Station.	83.3	41.5	3.65	. . . .	13	8	8	14	W	E	E
Chester.	West Chester.	67.0	40.0	5 46	. . . .	15	11	9	10	NE	NE	NW
Clarion.	Clarion— State Normal School.	73.7	39 2	2.09	. . . .	. .	10	8	12	SW	SW	SW
Clearfield.	Grampian Hills.	. . .	. . .	4.61	5.00	14	13	6	11	SW	SW	SW
Clinton.	Lock Haven.	. . .	. . .	3.97	. . . .	12	14	5	11	E	W	W
Columbia.	Catawissa.	75.0	43.2	4.42	. . . .	10	12	8	10	NE	N	N
Crawford.	Meadville— Allegheny College.	. . .	. . .	. . .	. . . .	. .	. .	. .	. .	. .	. .	. .
Cumberland.	Carlisle.	71.0	43.7	4.56	. . . .	14	11	7	12	W	W	W
Dauphin.*	Harrisburg.	74.3	42.0	3.69	. . . .	13	6	12	12	N	N	N
Delaware.	Swarthmore. Swarthmore College.	74.9	43 7	3.51	. . . .	8	. .	. .	. .	NW	NW	NE
Erie.*	Erie.	74.0	36 0	3 64	. . . .	14	9	10	11	W	W	W
Fayette.	Uniontown.	. . .	. . .	4 47	. . . .	10	14	5	11	SW	SW	W
Forest.	Tionesta.	. . .	. . .	. . . .	. . . .	. .	. .	. .	. .	. .	. .	. .
Fulton.	McConnellsburg.	68.1	40.7	5 28	12.00	11	11	9	10	N	W	W
Huntingdon.	Huntingdon— The Normal College.	. . .	. . .	4.42	. . . .	13	8	14	8	W	W	W
Indiana.	Indiana— State Normal School.	88.1	58.4	4.50	. . . .	6	14	6	10	W	W	W
Lackawanna.	Scranton.	. . .	. . .	. . . .	. . . .	. .	. .	. .	. .	. .	. .	. .
Lancaster.	Lancaster— Franklin and Marshal College.	70.2	41.6	6 54	. . . .	12	8	8	14	NE	W	W
Lawrence.	New Castle.	87.4	47.1	6.06	. . . .	8	11	5	14	NW	NW	NW

MONTHLY SUMMARY OF REPORTS- *Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	Total snowfall during month.	Number of days rain fall.	NUMBER OF DAYS Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Lebanon,	Myerstown,	79.4	63.7	5.47	. . . .	13	11	8	11	W	W	W
Luzerne,	Drifton—											
	Drifton Hospital,	. . .	. . .	5.89	. . . .	9	10	8	12	. . .	. . .	. . .
McKean,	Smethport,	. . .	. . .	. . .	. . . .	. .	. .	. .	. .	. . .	. . .	. . .
Mercer,*	Greenville—											
	Thiel College,	79.9	37.8	2.50	3.00	9	10	9	11	SE	NE	NW
Montgomery,	Pottstown,	68.0	41.0	6.15	. . . .	9	12	11	7	E	W	W
Northampton,	Bethlehem,	65.5	40.0	4.29	. . . .	8	14	6	10	W	W	W
Northumberland,	Shamokin,	. . .	. . .	. . .	. . . .	. .	. .	. .	. .	. . .	. . .	. . .
Perry,	New Bloomfield,	. . .	. . .	3.88	. . . .	12	11	7	12	N	N	W
Philadelphia,†	Philadelphia,	68.2	40.6	3.17	. . . .	14	6	8	16	NE	NE	NE
Potter,	Coudersport,	67.3	38.5	4.50	. . . .	. .	13	4	13	W	NW	NW
Schuylkill,	Girardville,	. . .	. . .	7.23	. . . .	11	14	6	10	NW	NW	NW
Snyder,	Selinsgrove,	72.4	43.2	3.02	. . . .	9	8	11	11	NE	NE	NW
Somerset,	Somerset,	80.0	42.0	4.55	12.50	10	11	7	12	NW	NW	NW
Sullivan,	Eagles Mere,	69.8	33.6	5.71	. . . .	8	12	6	12	NE	NE	NE
Tioga,	Wellsboro',	76.1	32.6	8.15	. . . .	12	11	6	13	N	N	N
Warren,	Columbus,	. . .	. . .	3.24	6.00	12	11	7	12	W	W	W
Wayne,	Honesdale,	. . .	. . .	5.55	. . . .	10	. .	. .	. .	. . .	. . .	. . .
York,*	York,	72.4	41.9	3.91	. . . .	13	17	6	7	NW	NW	NW

*Observations taken at 8 A. M. and 8 P. M. †Observations taken at 12 noon.

PRECIPITATION FOR APRIL, 1889.

	Erie.	New Castle.	Greenville.	Columbus.	Pittsburgh.	Uniontown.	Clarion.	Indiana.	Somerset.	Grampian Hills.	Kittanning.	Phillipsburg	Huntingdon.	Hollidaysburg.	Altoona.	Charlesy Ile.	McConnellsburg	Lock Haven.	State College.	York.	New Bloomfield.	Carlisle.	Wellsboro'	Hartleburg	Selinsgrove.	Wyoming.
1	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
	.00	.00	.00	.00	.00	.00	.00		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

PRECIPITATION FOR APRIL, 1889—*Continued.*

	Bethlehem.	Point Pleasant.	Germantown.	Forks of Neshaminy.	Lansdale.	Doylestown.	Smith's Corner.	Ottsville.	Frederick.	Selsholtzville.	Philadelphia.	Swarthmore.	Quakertown.	Honeadale.	Coudersport.	Dyberry.	Coatesville.	Westtown.	West Chester.	Pottstown.	Headlin.	Dilltion.	Lancaster.	Lebanon.	Gilbertsville.	Catawissa.	Harles Mere.
1	.30	.14		.07	.45	.73	.70	.83	.76	.61	.42	.43	.91	.18	.40	.36	.43		.31	.05	.42		.13		.51	.44	.15
2	.05		.09	.06	.33	.03	.06		.09		.21	.20	.10	.13	.10	.05	.22		.22	.06	.09		.12		.18	.02	
3									.05		.05			.11			.07		.13		.05				.08	.06	
4																	.02										
5																	.02										
6																	.01										
7																	.27										
8																											
9																											
10	.11				.13	.05	.06		.06	.19	.02		.01	.32		.30			.01		.01		.03		.15	.24	.42
11	.13		.17	.18	.22	.22	.22		.36	.61	.08	.07	.14		.40	.40			.13	.30	.13		.32		.86	.85	1.04
12													.19				.37				.45				.16		
13	.03			.05	.05												.02										
14																	.01										
15																	.15										
16																											
17	.18	.27	.17	.37	.30	.36	.25	.63	.17	.04	.20	.17	.06	.24		.25	.04		.04	.25	.33		.32		.16		
18																											
19	.13	.25	.14										.02														
20	.05																										
21																											
22																											
23																											
24																											
25	.81											.13	.25	2.90	1.30	2.00	1.92		.35	1.60	2.25		.97		1.47	.80	
26	2.12	3.52	2.15	3.43	2.40	3.46	3.51	3.04	2.19	4.70	1.53	1.73	1.83	.46	1.30	1.45	2.68		2.68	1.60	1.45		1.73		1.20	.67	
27																											
28									.21	.01	.44	.42	1.01	.48	.30	.30	.60		.81	.80	.64		.73		.83	.70	
29									.05		.17	.30	.22	.09	.60		.31		.25	.44	.30		.29		.73	.60	
30	4.29	5.11	3.20	4.08	4.00	4.92	5.02	4.64	3.86	6.22	3.17	3.51	4.83	5.55	4.60	4.55	7.06		5.46	6.15	6.33		6.54		7.23	4.42	5.71
31																											

MAY, 1889.

TEMPERATURE.

The mean temperature for May, 1889, was 62°0, which is one degree above the average.

The warmest period of the month occurred on the 9th, and the coldest on the 2d, 4th and 29th. Frosts were general throughout the state on these dates.

The highest temperatures reported were Carlisle, 96°; Hollidaysburg, 94°; Reading, 94°; Coatesville, 94°, and York, 94°. The lowest temperatures were Emporium, 25°; New Castle, 26°; Columbus, 26°, and Dyberry, 26°.

The highest mean monthly temperatures were Indiana, 68°.3; Annville, 66°.5, and Emporium, 64°.5. The lowest were Wellsboro', 55°1; Columbus, 56°.0, and Dyberry, 56°.3.

From January 1st to May 31st, the temperature excess was 404° at Philadelphia, 231° at Pittsburgh, and 56° at Erie.

BAROMETER.

The mean atmospheric pressure was 29.97, which is normal. The range between the extremes was about seven-tenths.

The highest noted was on the 18th, and the lowest during the 11th. Neither were attended by any unusual atmospheric conditions.

The minor depression of the 31st, accompanied the heavy rainfall on that date.

PRECIPITATION.

The average rainfall over the state during the month was 5.91 inches, which is an excess of over two inches. Had it not been for the phenomenal rainfall of the 31st, there would have been a deficiency in the western and middle portions of the state. The largest totals in inches for the month were McConnellsburg, 12.41; Grampian Hills, 11.60; Charlesville, 11.07; Harrisburg, 9.51; Smethport, 9.21, and Selinsgrove, 9.20. The excessive and unprecedented rainfall of the 31st, which caused disastrous floods, was at Grampian Hills, 8.37 inches; McConnellsburg, 7.08 inches; Charlesville, 6.71 inches; Selinsgrove, 6 inches; Emporium, 5.85 inches; Smethport, 5.50 inches; Hollidaysburg, 5.12 inches, and Harrisburg, 4.66 inches. In the southeastern portion of the state the fall was very light on this date, many stations reporting less than one-tenth of an inch.

From the 1st to the 10th there was a general absence of rain. From this time to the end of the month rains occurred almost daily at some stations.

WIND AND WEATHER.

The prevailing direction of wind was from the west, and the month may be characterized as warm and moist. Frosts were general from the

1st to the 4th, inclusive, and on the 29th, all of which considerably impaired growing crops and fruits.

The first thunder storm of the month occurred on the afternoon of the 10th, and was general throughout the state. The lightning and wind caused heavy damages in several places. In some sections hail-stones of large size fell in quite large quantities. The storm was from the northwest, and its approach was heralded by great banks of ominous looking clouds, which were violently agitated. At most stations the wind was of terrific force, and carried with it blinding and stifling clouds of dust, which fairly darkened the atmosphere. At Philadelphia a velocity of seventy-two miles was registered. Fortunately the great force was of short duration. With the bursting of the storm the temperature fell from ten to twenty degrees. At Philadelphia the self-registering barometer fell rapidly from 8 A. M. From 1.30 P. M., to 4 P. M., the fall was more decided. After the storm burst at 5 P. M., it rose one-tenth instantaneously. As a *dust storm* it was phenomenal in magnitude and intensity.

On the 31st, the central portion of the state was visited by one of the greatest rainfalls and floods ever known in this country for magnitude and destructiveness. Large sections were flooded, whole towns and cities were swept away, thousands of people drowned, and millions of dollars in property destroyed. It is estimated that from six to eight inches of rain fell in twenty-four hours over a large area of the central part of the state.

Extracts from the reports of observers, May 31st:

Grampian Hills.—From 11.40 P. M., 30th, to 11.20 P. M., of 31st, 8.37 inches of rain fell. Six inches of rain fell in seven hours. Most destructive flood in Anderson's Creek on record. Wind east.

McConnellsburg.—Easterly winds. 5.45 inches of rain from 4 P. M., 30th, to 4 P. M., 31st. Rain ceased midnight of 31st: 8.31 inches in thirty-two hours. Disastrous floods.

Charlesville —South, southeast, and southwest winds. Heaviest rains in years; 6.71 inches from 9 P. M., 30th, to 9 P. M., 31st. Storm began 3.15 P. M., 30th.

Selinsgrove.—Southeast winds. Rain began 2.20 P. M., 30th: six inches of rain on 31st. Thunder in east at 3 P. M.

Harrisburg.—On the 31st and night of 1st, eight inches of rainfall in eighteen hours.

Emporium.—Rain began 9 P. M., 30th, ended 11.20 P. M., 31st. Total rainfall, 5.85 inches. Water twelve feet above low-water mark, and from two to three feet higher than flood of 1861.

Smethport.—Southeast winds. Rain from 11 P. M., 30th, to 11 P. M., 31st. Total rainfall, 5.50 inches.

Hollidaysburg.—Strong southerly winds until about 4 P. M., then veered a little easterly and gradually subsiding. Measurements of rain-

fall by rain gauge, May 30th, from 4 P. M., to 9 P. M., .39 inches; to 7 A. M., 31st, 2.11 inches; to 12 M., 3.49 inches; to 5.30 P. M., 4.23 inches; to 7 P. M., 4.97 inches; to 9 P. M., 5.51 inches; to 7 A. M., June 1st, 6.10 inches. Strong northwest wind at midnight, 31st.

Huntingdon.—The flood of history in the Juniata Valley. Water higher than ever before known: 5.41 inches of rain fell from 7 A. M., 31st, to 2 A. M., June 1st; 6.57 inches from 4 P. M., 30th, to 2 A. M., June 1st. Winds east and southwest.

York.—High winds from southwest: 3.19 inches of rain from early morn of the 31st to early morn of June 1st. Crops badly damaged.

Carlisle.—Rain gauge overflowed. Growing grain injured. Heavy washouts and bridges washed away. Water higher than ever known. Southeast winds.

New Bloomfield.—Terrible rain, with thunder. East winds. Rainfall, 3.82 inches.

Annville.—A continued succession of cloud bursts. Strong southeast winds. Occasional thunder.

Quakertown.—A peculiar storm. Strong southeast winds. Upper clouds nearly stationary. Dark and threatening lower clouds, moving rapidly from south. Very little rain.

Coudersport.—Rain began 5 P. M., 30th, ended morning of June 1st. Total rainfall, 5.40 inches; highest water ever known in this section. Great damage done in Potter county. Wind south.

MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for May, 1889.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.										
							MAXIMUM.		MINIMUM.				DAILY RANGE.			
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Allegheny,*	Pittsburgh,	847	29.950	30.230	29.620	61.6	90.0	10	37.0	2, 4	72.2	52.5	19.7	32.0	5	4.0	31
Bedford,	Charlesville,	1,300	. . . .	. . . .	. . . .	58.9	89.5	9	29.0	2	71.1	51.7	19.4	34.5	8	7.5	27
Berks,*	Reading,	304	29.989	30.314	29.704	60.5	94.0	5	32.5	3	75.3	50.1	25.2	45.0	10	6.5	27
Blair,†	Altoona,	1,181	. . . .	. . . .	. . . .	64.1	91.0	10, 18	36.0	2	74.4	54.8	19.6	29.0	18	8.0	31
Bradford,	Wysox,	718	29.964	30.238	29.728	58.9	89.2	17	29.5	4, 29	71.3	46.5	24.8	44.0	5	5.5	22
Bucks,	Quakertown,	536	29.980	30.330	29.660	60.7	89.5	9	30.5	3	73.2	47.9	25.3	42.5	8	8.5	25
Cameron,	Emporium,	1,030	. . . .	. . . .	. . . .	64.5	92.0	18	25.0	4	73.2	44.8	28.4	48.0	5	5.0	31
Centre,	State College— Agricultural Experiment Station,	1,191	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Chester,	West Chester,	455	29.958	30.345	29.657	62.4	90.0	9	38.0	2	72.2	53.6	18.6	32.0	5	5.0	30
Clarion,	Clarion— State Normal School,	1,530	. . . .	. . . .	. . . .	58.0	86.0	10, 18	28.0	2	66.2	43.6	22.6	44.0	15	7.0	10
Clearfield,	Grampian Hills,	1,450	. . . .	. . . .	. . . .	59.6	90.0	9, 17	30.0	2, 29	70.6	49.8	20.8	38.0	6	4.0	31
Clinton,	Lock Haven,	560	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Columbia,	Catawissa,	491	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Crawford,	Meadville— Allegheny College,	1,050	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
Cumberland,	Carlisle,	480	. . . .	. . . .	. . . .	63.4	96.0	8	36.0	4	74.7	56.4	18.3	34.0	9	3.0	26
Dauphin,*	Harrisburg,	361	29.984	30.260	29.350	61.5	90.0	9, 10	40.0	4	71.9	53.5	18.4	35.0	8	5.0	27
Delaware,	Swarthmore— Swarthmore College,	190	29.958	30.324	29.676	62.3	89.9	10	37.5	22	76.0	51.1	24.9	36.6	30	6.5	27
Erie,*	Erie,	681	29.960	30.210	29.610	58.0	89.0	18	35.0	29	65.0	50.0	15 0	29.0	30	4.0	21
Fayette,	Uniontown,	1,000	29.966	30.222	29.750	60.9	88.0	10	30.0	4	71.6	48.4	23.2	39.0	6	5.0	22
Fulton,	McConnellsburg,	875	. . . .	. . . .	. . . .	62.1	93.0	9	31.0	2	73.4	48.9	24.5	44.0	8	6.0	31
Huntingdon,	Huntingdon— The Normal College,	650	. . . .	. . . .	. . . .	60.7	93.0	17, 18	28.0	2	71.4	46.0	25.4	46.0	8	3.0	22
Indiana,	Indiana— State Normal School,	1,350	. . . .	. . . .	. . . .	68.3	85.0	25	40.0	3	79.2	58.0	21.2	41.0	3	19.0	8
Lancaster,	Lancaster— Franklin and Marshall College,	413	29.976	30.281	29.708	62.5	91.0	9	36.0	2	72.9	46.0	26.9	38.5	8	7.0	27
Lawrence,	New Castle,	982	. . . .	. . . .	. . . .	61.8	90.0	9, 17	26.0	2	71.5	44.7	26.8	45.0	6	11.0	10
Lebanon,	Myerstown,	474	29.939	30.262	29.741	60.4	93.9	9	32.6	2	74.8	50.4	24.4	41.8	8	7.2	27
Luzerne,	Drifton— Drifton Hospital,	1,655	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .

McKean	Smethport	1,500				57.4	89.5	18	27.0	4	69.3	44.	25.	44 5	8	7.5	2
Mercer,*	Greenville—																
	Thiel College	1,000	29.865	30.138	29.569	56.3	87.4	10	27.0	2	70.8	44.4	36.	39.5	5	8.0	31
Montgomery	Pottstown	150				63.0	91.0	10	36.0	3	74.3	55.3	19.	35.0	7		27
Monroe	Marshall's Creek	520				58.7	75.1	17	42.1	2							
Northampton	Bethlehem	360				64.0	92.0	9	34.0	4	74.0	51.0	23.	45.0	6	8.0	27
Perry	New Bloomfield	400				62.1	93.0	9	29.0	4	74.6	46.3	28.	48.0	6	6.0	31
Philadelphia,*	Philadelphia	117	29.982	30.360	29.650	63.0	90.0	9, 10	43.0	2, 3	74.1	55.3	18.	33.0	9	4.0	27
Potter	Coudersport	1,670				59.7	90.0	17	26.0	29	69.4	44.5	24.	46.0	8	7.0	3
Schuylkill	Girardville	1,000	29.964	30.314	29.609	60.0	89.0	9	33.0	2	70.7	49.3	21.	40.0	5		20
Snyder	Selinsgrove	445				63.2	92.0	9, 10	40.0	3, 4	71.3	55.2	16.	36.0	5	4.0	27
Somerset	Somerset	2,250				54.2	92.0	17	28.0	2	68.3	44.6	23.	44.0	7	11.0	25
Sullivan	Eagles Mere	2,000				57.3	86.0	10	31.0	2	64.7	48.7	16.	27.0	29	3.0	21
Tioga	Wellsboro'	1,327	29.932	30.258	29.622	55.1	90.0	17	30.0	29	78.9	67.2	11.	20.0	.	5.2	. .
Warren	Columbus	1,410				56.0	92.0	17, 18	26.0	1, 29	68.9	43.3	25.	48.0	8	3.0	21
Wayne	Honesdale	1,000				56.4	83.0	17	28.0	4	67.5	45.2	22.	38.0	5	4.0	27
York,*	York	385	29.977	30.216	29.728	63.2	94.0	9	35.0	2, 4	74.9	30.9	44.	42.0	5	9.5	27

* Observations taken at 8 A. M. and 8 P. M.

† Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	PRECIPITATION. Number of days rainfall.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	WIND. PREVAILING DIRECTION. 2 P. M.	WIND. PREVAILING DIRECTION. 9 P. M.
Allegheny.*	Pittsburgh.	62.5	47.8	6.45	1.	7	9	15	NW	NW	NW
Bedford.	Charlesville.	71.4	50.0	11.07	13	14	7	10	W	W	SW
Berks.*	Reading.	82.6	53.5	3.60	9	15	7	9	NW	NW	NW
Blair.†	Altoona.	55.1	48.0	4.75	9	. . .	. . .	. . .	. . .	. . .	. . .
Bradford.	Wysox.	74.6	50.0	4.76	10	9	6	16	NW	NW	NW
Bucks.	Quakertown.	81.0	55.1	5.45	12	14	9	8	SW	NW	NW
Cameron.	Emporium.	. . .	. . .	8.04	11	12	7	12	W	W	W
Centre.	State College—										
	Agricultural Experiment Station.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Chester.	West Chester.	72.0	52.5	5.78	15	14	7	10	NW	NW	SE
Clarion.	Clarion—										
	State Normal School.	72.0	49.0	4.59	9	10	13	8	SW	SW	SW
Clearfield.	Grampian Hills.	. . .	. . .	11.60	12	8	12	11	W	W	W
Clinton.	Lock Haven.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Columbia.	Catawissa.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Crawford.	Meadville—										
	Allegheny College.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cumberland.	Carlisle.	74.5	57.3	4.52	14	9	9	13	W	W	W
Dauphin.*	Harrisburg.	72.0	51.6	9.51	12	4	19	8	W	W	W
Delaware.	Swarthmore—										
	Swarthmore College.	87.0	58.0	5.84	9	7	4	20	NW	NW	NW
Erie.*	Erie.	69.0	47.0	2.61	14	9	11	11	SW	SW	SW
Fayette.	Uniontown.	70.0	50.5	6.93	12	10	15	6	W	W	W
Fulton.	McConnellsburg.	74.0	52.1	12.41	13	11	8	12	W	W	W
Huntingdon.	Huntingdon—										
	The Normal College.	. . .	. . .	7.18	13	9	15	7	W	W	W
Iana.	Indiana—										
	State Normal School.	81.0	62.0	4.71	8	16	5	10	W	W	W
aster.	Lancaster—										
	Franklin and Marshall College.	82.6	57.1	4.40	12	10	11	10	W	W	SE
a.	New Castle.	. . .	. . .	3.20	6	6	14	11	NW	NW	NW
h.	Myerstown.	83.6	55.8	5.47	14	14	4	13	W	W	W
.	Drifton—										
	Drifton Hospital.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

McKean,	Smethport,	...	...	9.21	8	11	..	10	S	S	S
Mercer,*	Greenville—										
	Thiel College,	84.9	49.8	2.57	10	5		19	SW	SW	SW
tgomery,	Pottstown,	75.0	53.0	7.47	9	17	9	5	W	W	W
e,	Marshall's Creek,	73.5	55.5	3.12	13	10	11	10	W	W	W
mpton,	Bethlehem,	60.0	52.0	4.30	10	17			W	W	W
	New Bloomfield,	...	...	6.06	12	11	9	11	W	W	W
elphia,*	Philadelphia,	71.4	58.0	4.32	15	8	11	12	NW	NW	NW
	Coudersport,	78.9	52.3	7.90	8	10	3	18	W	W	W
kill,	Girardville,	...	...	6.93	12	12	2	17	NW	NW	NW
	Selinsgrove,	...	...	9.20	10	13	8	10	NW	SE	NW
set,	Somerset,	...	...	8.32	9	14	5	12	NW	NW	NW
m,	Eagles Mere,	70.0	47.5	9.21	10	10	8	13	SW	SW	SW
	Wellsboro',	78.9	42.3	3.45	10	12	9	10	N	W	N
,	Columbus,	75.0	47.0	2.85	15	11	9	11	SW	SW	SW
	Honesdale,	...	...	5.47	12	...	...	...	...	...	...
	York,	70.0	52.5	5.65	10	17	7	7	NW	NW	NW

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

PRECIPITATION FOR MAY, 1889.

	Erie.	Greenville.	New Castle.	Columbus.	Pittsburgh.	Uniontown.	Indiana.	Somerset.	Grampian Hills.	Emporium.	Philipsburg.	Huntingdon.	Hollidaysburg.	Altoona.	Charlesville.	McConnellsburg.	Lock Haven.	New Bloomfield.	Carlisle.	Wellsboro'.	Harrisburg.	Selinsgrove.	Wyoox.	Eagles Mere.	Catawissa.	Girardville.	Myerstown.
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8	.36	.20	1.01	.37	.69	.98	.15	.50	.49	.44	.87	.45	.33	.50	.50	.17		.18	.15	.10	.19	.16	.19	.04		1.01	.25
9		.14		.11	2.27	.60	.06	1.20	.48	.06	.24	.02	.31	.35	.30	.32		.34	.45	.14	.34	.16	.30	.35		.09	.43
10	.02	.20	.32	.04	.45	.41	.10	.05	.34	.09	.24	.02	.09	.05	.26	.05		.30	.47	.05	.85	.70	.16	.42		.09	.01
11	.07			.01	.05	.05	.12		.31				.02		.15				.05								
12	.12	.02			.01		.08		.11			.01	.05														
13	.09	.15	.35	.12	.09	.04		.10	.05	.04	.05	.16	.06		.06	.03		.16	.15	.15	.11	.15	.11	.15		.06	.19
14	.09	.05		.06	.01	.21		.32	.11	.04	.05	.05	.04	.08	.22	.07		.25	.08	.04	.38	.09	.38			.18	.94
15	.06	.02		.03	.02	.04		.31	.03		.03	.03	.02	.06	.01	.12		.10	.04	.05	.07	.15	.07			.91	.06
16	.02				.32			.20	.21		.17	.24	.07		.20	.07		.04	.05	.05	.08		.15			.20	.14
17	.41	.05	.15	.15	.47	.10			.22		.15	.03	.04	.18	.40	.12		.16	.05	.36	.22	.37	.48	.36		.07	.01
18	.09	.02		.06	.06	.21			.07	.25	.95	.46	.99	.13	.15	.50	.67	.44	.70	.12	.82	.47	.97	.96		.07	.84
19	.06	.02		.03	.01	.09			.05	.15	.15	.50	.18	.12	.98	.67		.44	.78	.36	.82	.47	.97	.82		.91	.02
20	.01	.05		.01	.26				.12	.12		.09	.39		.01	.25		.37	.15	.05	.20	.46	.32	.48		.01	.01
21	.06	.03		.06	.21		1.20		.25	.05		.05	.12		.05	.08		.70	.05	.65	.30	.45	.32	.36		.61	.07
22	.04	.01		.05	.05		2.00		.35	.12		.09	.39		.01	.33		.37	.40	.70	.30	.60	.90	.17		.93	.08
23	.02	.01		.04	.01		1.00		.11	.04		.04	.08			.08		.08	.03	.10	.08	.15	.05	.15		.04	.01
24	.01	.01		.01	.01				.05	.01		.01	.01			.01		.01	.01	.01	.01	.01	.01	.01		.01	.01
25	.06	.02		.01	.01				.01																		
26	.02	.01			.01																						
27	.01	.03			.01																						
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	2.31	2.55	3.20	2.86	6.45	6.83	4.71	8.32	11.00	8.04	5.98	7.18	7.43	4.75	11.07	12.41		6.06	4.52	3.45	9.31	9.30	4.76	9.21		6.98	5.47

PRECIPITATION FOR MAY, 1889—*Continued.*

	Lancaster.	Dilltown.	Reading.	Bethlehem.	Pottstown.	West Chester.	Kennett Square.	Coatesville.	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Coudersport.	Selinsgrove.	Fredericksburg.	Ottsville.	Smith's Corner.	Doylestown.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.	Dyberry.	Clarion.	York.	Marshall's Creek.	Smethport.
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	4.46		3.10	4.20	7.47	5.78	3.16	5.29	5.47	5.45	5.84	4.82	7.90	4.54	4.65	5.85	4.75	4.82	4.35	5.70	5.73	5.59	4.72	4.59	5.65	3.12	9.21

JUNE, 1889.

TEMPERATURE.

The mean temperature for the month of June, 1889, was 66°.5, which is from two to three degrees below the average, and two degrees below the corresponding month of last year.

The means of the daily maxima and minima were 76°.4 and 57°.0, respectively.

Neither extreme high nor low temperature were noted during the month.

The warmest period at most stations was on the 21st, and the coldest on the 2d, 7th and 24th. Frost occurred in some of the northern border counties on these dates.

The highest recorded temperatures were: Reading, 95°; Carlisle, 93°; Pottstown, 91°, and York, 91°.

The lowest were Dyberry, 33°; Honesdale, 35°, and State College, 37°.

BAROMETER.

The mean pressure was 0.06 above the normal. The greatest pressure was on the 24th, and the least on the 5th. The extreme range was about 0.75.

PRECIPITATION.

The average rainfall for June, 1889, was 5.43 inches, which is an excess of 1.63 inches.

The entire month was characterized by frequent and heavy rainfalls. The great and destructive rain-storm of the 30th and 31st of May continued to the morning of June 1st over a great extent of country. On the last-named date, over twenty stations report a fall of from one to three inches, making a total in inches for the three days' storm, as follows: Wellsboro', 9.80; McConnellsburg, 8.99; Grampian Hills, 8.60; Harrisburg, 7.78; Selinsgrove, 7.53; Charlesville, 7.50; Huntingdon, 6.57; Coudersport, 6.33; Phillipsburg, 6.09; Smethport, 6.00; New Bloomfield, 6.14; Emporium, 5.97; Hollidaysburg, 5.80; Eagles Mere, 5.53; Altoona, 5.33; Girardville, 4.59; Somerset, 4.43; Myerstown, 3.37.

For the month of June, 1 station had rain on 21 days, 4 stations on 20 days, 1 station on 19 days, and 3 stations on 18 days. The average for the state was 15 days.

The following stations report the greatest total in inches: Wellsboro,' 10.04; Myerstown, 8.66; Reading, 8.21; Girardville, 8.01; Seisholtzville, 7.91; Ottsville, 7.58; Smith's Corner, 7.54; Uniontown, 7.36; Quakertown, 7.31, and Harrisburg, 7.18.

The excessive rainfall, and the unusual number of rainy days, marks

the month as exceptionally wet. With the exception of the 2d, 23d and 24th, rain fell on every day in some part of the state.

WIND AND WEATHER.

The prevailing winds were from the west and southwest, with no severe and general gales. A few frosts were reported, but no damage of any amount resulted from them. The month was excellent for the growth of all vegetation, and large crops were secured where harvesting was not interfered with by the excessive wet.

In some sections the damage to the hay crop was very great.

Average Number.—Rainy days, 15; clear days, 5; fair days, 12; cloudy days, 13.

MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for June, 1889.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.											
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Allegheny,*	Pittsburgh,	847	30.004	30.420	29.720	67.3	87.0	21, 30	46.0	2	76.1	60.4	15.7	24.0	7	7.0	1
Bedford,	Charlesville,	1,300	. . .	. . .	. . .	64.8	86.5	21	43.0	24	76.1	58.7	17.4	29.5	24	9.0	11
Berks,*	Reading,	304	30.043	30.399	29.721	67.8	95.0	20	44.0	7	80.9	58.9	22.0	34.0	21	5.0	11
Blair,†	Altoona,	1,181	. . .	. . .	. . .	69.6	88.0	22	47.5	2	79.2	60.1	19.1	26.5	18	11.0	19
Bradford,	Wysox,	718	30.010	30.466	29.659	69.0	87.5	21	39.0	7	76.7	55.0	21.7	38.0	7	6.1	12
Bucks,	Quakertown,	356	30.030	30.450	29.570	67.2	87.5	21	40.0	7	79.0	56.1	23.9	35.2	7	14.7	5
Cameron,	Emporium,	1,030	. . .	. . .	. . .	68.2	90.0	21	38.0	7	77.7	53.9	23.8	39.0	21	2.0	5
Centre,	State College—Agricultural Experiment Station,	1,191	29.977	30.385	29.629	64.9	85.0	21	37.0	2	73.9	52.4	21.5	31.0	21	14.0	5
Chester,	West Chester,	455	30.024	30.446	29.643	68.9	86.5	21	48.0	7	77.5	61.2	16.3	26.0	7	10.0	5
Clarion,	Clarion—State Normal School,	1,530	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Clearfield,	Grampian Hills,	1,450	. . .	. . .	. . .	64.5	88.0	21	48.0	1, 2	75.0	60.0	15.0	28.0	24	6.0	5
Clinton,	Lock Haven,	560	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Columbia,	Catawissa,	491	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Crawford	Meadville—Allegheny College,	1,050	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cumberland.	Carlisle,	580	. . .	. . .	. . .	69.1	93.0	21	50.0	2	78.5	63.1	15.4	31.0	20	2.0	12
Dauphin,*	Harrisburg,	361	30.054	30.480	29.690	67.4	87.0	21	50.0	2	76.8	60.2	16.6	26.0	13	3.0	12
Delaware,	Swarthmore—Swarthmore College,	100	30.016	30.436	29.655	69.3	87.2	20	46.2	5	78.1	59.8	18.3	32.5	8	10.9	10
Erie,*	Erie,	681	30.007	30.460	29.680	64.0	87.9	9	45.0	1	70.0	57.0	13.0	22.0	9	4.0	22
Fayette,	Uniontown,	1,000	30.022	30.332	29.470	67.8	87.0	21	41.0	2	76.2	58.1	18.1	30.0	24	6.0	1
Fulton,	McConnellsburg,	875	. . .	. . .	. . .	66.2	87.0	21	40.0	7	77.6	57.2	19.4	36.0	7	5.0	19
Huntingdon,*	Huntingdon—The Normal College,	650	. . .	. . .	. . .	65.2	89.0	29	38.0	2	75.1	54.0	20.5	35.0	7	8.0	12
Indiana,	Indiana—State Normal School,	1,350	. . .	. . .	. . .	67.9	87.0	21	44.0	23	76.5	58.2	18.3	29.0	21	10.0	26
Lawrence,	New Castle,	932	. . .	. . .	. . .	68.7	87.0	29	38.0	6	77.1	53.3	23.8	35.0	7	15.0	11
Lebanon,	Myerstown,	474	30.014	30.722	29.654	66.3	87.4	20	43.0	7	78.9	58.4	20.5	34.0	7	11.2	12
Luzerne,	Drifton—Drifton Hospital,	1,655	. . .	. . .	. . .	63.6	86.0	21	44.0	8	75.9	55.0	20.9	34.0	8	10.0	5
McKean,	Smethport,	1,500	. . .	. . .	. . .	67.4	88.0	30	38.0	25	75.8	52.0	23.8	37.0	25	6.0	11
Mercer,*	Greenville—Thiel College,	1,000	29.955	30.390	29.647	63.5	87.0	30	41.5	1	73.7	54.8	18.9	32.0	24	9.9	22
Montgomery,	Pottstown,	150	. . .	. . .	. . .	71.3	91.0	21	53.0	24	78.9	64.0	14.9	28.0	21	3.0	5
Northampton,	Bethlehem,	360	. . .	. . .	. . .	70 2	88.0	21	46.0	7	79.1	6010	19.1	35.0	8	7.0	25
Perry,	New Bloomfield,	400	. . .	. . .	. . .	66.2	90.0	20	40.0	19	74.2	54.2	20.0	38.0	9	12.0	12
Philadelphia,*	Philadelphia,	117	30.060	30.460	29.680	69.8	88.0	20, 21	54 0	6, 7	79.4	63.3	16.1	23.0	20	10.0	12

Potter,	Coudersport,	1,670	. . .	. . .	. . .	65.2	89.0	20, 21	35.0	7	75.4	48.8	26.6	41.0	20	11.0	1
Schuylkill,	Girardville,	1,000	30.052	30.457	29 716	66.0	85.0	21	47.0	7	75.7	56.0	19.7	35.0	8	11.0	12
Snyder,	Selinsgrove,	446	. . .	. . .	. . .	68.2	86.0	16, 30	55 0	6, 7	75.7	63.0	12.7	20.0	24	6.0	5
Somerset,	Somerset,	2,250	. . .	. . .	. . .	60.4	83.0	21	41.0	1, 23	73.6	54.4	19.2	30.0	24	7.0	22
Sullivan,	Eagles Mere,	2,060	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tioga,	Wellsboro',	1,327	29.953	30.463	29.608	63.3	86.0	10, 29	42.0	24	74.3	55.2	19.0	9 5	24	3.0	5
Warren,	Columbus,	1,410	30.121	30.576	29.802	63.2	90.0	30	38.0	6, 7, 24	73.8	52.6	21.2	40 0	29	8.0	11
Wayne,	Honesdale,	1,000	. . .	. . .	. . .	63.7	82.0	10, 29	35.0	7	73.7	53.7	20.9	36.0	7	9.0	1
York,*	York,	385	30.036	30.489	29.745	66.5	91.0	21	49.0	1, 2, 24	79.8	59.6	20.2	33.0	7	5.0	25

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	PRECIPITATION. Number of days rain-fall.	NUMBER OF DAYS Clear.	NUMBER OF DAYS Fair.	NUMBER OF DAYS Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	WIND. PREVAILING DIRECTION. 2 P. M.	WIND. PREVAILING DIRECTION. 9 P. M.
Allegheny,*	Pittsburgh,	70.4	56.8	4.98	18	1	8	21	SW	SW	SW
Bedford,	Charlesville,	81.8	59.3	4.26	15	5	12	13	W	SW	W
Berks,*	Reading,	85.1	62.6	8.21	16	11	7	12	NW	. . . .	SW
Blair,†	Altoona,	62.5	56.0	4.73	17	. .	. .	. .	. .	. .	. .
Bradford,	Wysox,	82.2	60.0	4.86	16	7	7	16	SE	SW	NW
Bucks,	Quakertown,	86.5	63.7	7.31	17	4	15	11	SW	SW	SW
Cameron,	Emporium,	74.8	60.3	4.63	12	4	16	10	E	W	W
Centre,	State College— Agricultural Experiment Station,	83.2	59.9	5.37	15	3	13	14	W	W	W
Chester,	West Chester,	75.0	60.0	5.38	19	11	14	5	SW	SW	SW
Clarion,	Clarion— State Normal School,	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Clearfield,	Grampian Hills,	. .	. .	3.71	17	3	10	17	W	SW	SW
Clinton,	Lock Haven,	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Columbia,	Catawissa,	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Crawford,	Meadville— Allegheny College,	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Cumberland,	Carlisle,	84.4	64.0	4.50	17	5	14	11	S	S	S
Dauphin,*	Harrisburg,	76.6	59.4	7.18	20	5	15	10	E	E	E
Delaware,	Swarthmore— Swarthmore College,	78.5	63.0	5.48	10	3	8	19	SW	SW	SW
Erie,*	Erie,	76.0	56.0	6.02	8	3	9	18	SE	SE	SE
Fayette,	Uniontown,	79.0	61.5	7.56	21	7	19	4	W	W	W
Fulton,	McConnellsburg,	78.1	58.2	5.17	15	8	13	9	W	W	W
Huntingdon,	Huntingdon— The Normal College,	. .	. .	5.00	16	5	10	15	W	W	W
Indiana,	Indiana— State Normal School,	80.2	61.0	3.39	13	4	8	18	SW	W	SW
Lawrence,	New Castle,	. .	. .	6.50	9	3	4	23	SE	SE	SE
Lebanon,	Myerstown,	90.0	63.8	8.68	13	7	18	5	W	W	W
Luzerne,	Drifton— Drifton Hospital,	. .	. .	4.59	11	4	16	10	. .	. .	. .
McKean,	Smethport,	80.0	61.0	5.93	13	4	14	12	S	S	S
Mercer,*	Greenville— Thiel College,	. .	. .	3.51	10	5	5	20	SW	SW	SW

Montgomery	Pottstown	76.5	62.0	6.20	10	13	11	6	W	W	W.
Northampton	Bethlehem	73.0	61.0	5.28							
Perry	New Bloomfield			6.25	13	5	12	13	S	SE	SE
Philadelphia,*	Philadelphia	74.0	60.8	3.39	13	2	13	15	SW	SW	SW
Potter	Coudersport	80.4	60.4	4.80	11	7	6	17	W	W	W
Schuylkill	Girardville			8.01	15	10	12	8	W	W	W
Snyder	Selinsgrove			5.10	14	3	15	12	SW	SE	SE
Somerset	Somerset			3.87	14	6	11	13	SW	SW	SW
Sullivan	Eagles Mere										
Tioga	Wellsboro'			10.04	20	4	12	14	S	SW	SW
Warren	Columbus	80.2	55.6	6.12	18	4	9	17	SW	SW	SW
Wayne	Honesdale			5.13	12						
York.*	York	72.2	59.4	5.13	13	15	8	7	SW	SW	SW

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

PRECIPITATION FOR JUNE, 1889.

	Erie.	New Castle.	Greenville.	Columbus.	Pittsburgh.	Uniontown	Clarion.	Indiana.	Smethport.	Somerset.	Grampian Hills.	Emporium.	Phillipsburg.	Huntingdon.	Hollidaysburg.	Altoona.	Charlesville.	McConnellsburg.	State College.	York.	New Bloomfield.	Carlisle	Wellsboro'	Harrisburg.	Selinsgrove.
1.	.14	1.05	. . .	.34	. . .	.04	. . .	. .	.50	. . .	. . .		3.26	1.75	.30	2.30	.18	.68	1.04	1.70	2.07	1.50	7.45	3.12	1.07
2.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .	. . .	. . .	. . .		. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
3.	.04	. . .	. . .	. . .	.04	.21	. . .	. .	.20	.50	. . .		.01	.12	.12	. . .	.29	.35	.05	.18	. . .	. . .	. . .	. . .	.06
4.	.04	1.50	. . .	.05	.44	.06	. . .	. .	.50	. . .	.20	.25	.02	.16	.05	.03	.13	.45	.64	.46	.90	.52	.10	.30	.63
5.	.03	. . .	. . .	.12	.08	.21	. . .	. .	.70	. . .	.03	.22	.02	. . .	.02	.03	. . .	. . .	.05	.50	. . .	.05	.12	.32	.34
6.	.02	. . .	. . .	.08	. . .	. . .	. . .	. .	. . .	.08	. . .		. . .	. . .	. . .	.02	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
7.	.08	.30	. . .	.10	. . .	.02	. . .	.18	.40	. . .	. . .		. . .	. . .	.05	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.05	. . .	. . .
8.	.90	. . .	. . .	.97	.19	.43	. . .	.01	.30	. . .	.30	.60	.45	.15	.01	.03	. . .	.17	.22		.14	.20	.08	.08	.05
9.	.24	. . .	. . .	.12	.06	. . .	. . .	. .	.40	. . .	. . .	.16	.08	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.05	. . .	. . .
10.	.02	. . .	. . .	. . .	.02	.23	. . .	.10	.10	.33	.25	.20	.20	.04	.14	.05	.08	. . .	.08	. . .	.06	.05	.12	.20	.17
11.	. . .	.35	.17	.15	.90	.19	. . .	.80	.60	. . .	.30	.18	.12	.38	.30	. . .	.15	.15	.15	.47	.52	.05	.16	.24	.31
12.	. . .	. . .	. . .	. . .	.08	.21	. . .	.25	. . .	.30	.18		.20	.12	.13	.57	.15	.17	.15	.20	.10	.11	.06	.12	.10
13.	. . .	. . .	. . .	. . .	. . .	.01	. . .	. .	. . .	. . .	. . .		. . .	.01	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.01	. . .	. . .	. . .
14.	.04	. . .	.32	.02	.08	.29	. . .	.10	.15	. . .	. . .		. . .	.01	.40	. . .	1.93	.86	. . .	. . .	. . .	.08	. . .	. . .	. . .
15.	.82	.50	.23	.51	1.73	.51	. . .	.70	. . .	.17	.98	.32	.24	.68	.19	.33	.04	.30	.29	.16	.33	. . .	.25	.75	.21
16.	.99	. . .	.62	.50	.04	.27	. . .	.02	. . .	.25	.06		.05	. . .	.02	.15	. . .	. . .	.19	.05	. . .	.03	. . .	. . .	. . .
17.	2.15	.57	1.19	.92	.12	.14	. . .	. .	.85	.35	.16	1.02	.16	.31	.02	.03	.20	.41	.80	.15	.29	. . .	.65	.31	.29
18.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .	. . .	. . .	.20		.25	. . .	.01	.10	. . .	. . .	. . .	. . .	. . .	.26	.10	. . .	. . .
19.	.10	. . .	.04	.11	.31	.23	. . .	.10	.30	.88	. . .	.11	.02	.10	.09	.02	.06	.05	.04	. . .	. . .	. . .	.05	.02	. . .
20.	.10	. . .	. . .	.25	. . .	.27	. . .	. .	. . .	. . .	.06		.01	. . .	. . .	.34	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
21.	.14	.78	.20	.13	.20	.78	. . .	.28	.75	.30	. . .	.47	. . .	.40	.29	. . .	.11	.26	.97	.10	.81	. . .	.42	.18	.30
22.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .	. . .	. . .	.45		.35	. . .	. . .	.44	. . .	. . .	. . .	.80	. . .	.73	. . .	.10	. . .
23.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .	. . .	. . .	. . .		. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
24.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .	. . .	. . .	. . .		. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
25.	. . .	. . .	.10	.08	.32	25	. . .	.40	. . .	.30	. . .		. . .	.05	.06	. . .	.15	.13	. . .	.01	.08	.05	.10	.04	.10
26.	.63	. . .	.46	.65	.09	. . .	. . .	.25	.33	.20	.16	.45	.26	.07	.29	.23	.26	.20	.18	.35	.80	.65	.15	.50	.35
27.	.04	.65	.18	.02	.21	. . .	. . .	. .	. . .	.03	.26	.05	.01	. . .	.01	.04	. . .	. . .	. . .	. . .	.01	.02	. . .	.06	. . .
28.	. . .	.80	. . .	. . .	.02	.67	. . .	. .	. . .	.09	. . .		.05	.45	. . .	. . .	.60	.43	.12	. . .	.14	.13	.08	.12	.62
29.	. . .	. . .	. . .	. . .	. . .	.28	. . .	. .	. . .	. . .	.02		.08	. . .	.12	. . .	.03	.56	. . .	. . .	. . .	.15	. . .	.72	. . .
30.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.10	. . .	. . .	.10		. . .	. . .	. . .	.02	. . .	. . .	. . .	. . .	. . .	. . .	.05	. . .	. . .
31.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. .	. . .	. . .	. . .		. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
	6.02	6.50	3.51	5.12	4.93	7.36	. . .	3.39	5.93	3.87	3.71	4.63	5.84	5.60	2.71	4.73	4.26	5.17	5.87	5.13	6.25	4.59	10.40	7.18	5.10

PRECIPITATION FOR JUNE, 1890—*Continued.*

	Wyoox.	Girardville.	Myerstown.	Drifton.	Reading.	Pottstown.	West Chester.	Coatesville.	Dyberry.	Coudersport.	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Selsholtzville.	Frederick.	Ottsville.	Smith's Corner.	Doylestown.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.	Bethlehem.
1.	.14	3.05	1.62	.36	2.01	1.00	1.20	1 07	.71	. . .	.25	.95	.58	.46	1.93	.98	.19	1.02	.68	1.67	.70	. . .	.44	1.00
2.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
3.	.35	.02	. . .	. . .	. . .	. . .	.03	.02	. . .	. . .	. . .	.03	. . .	.02	. . .	. . .	.15	.04	. . .	. . .	. . .	.04	. . .	. . .
4.	.57	.90	.15	.76	.03	.60	.03	.10	.09	.30	.12	.04	.02	. . .	. . .	.00	.13	.06	. . .	. . .	.03	. . .	.01	.22
5.	.15	.07	.31	. . .	.52	. . .	.25	.25	.30	.10	.34	.16	.34	.20	.33	.30	. . .	.10	.24	. . .	.14	.09	.01	. . .
6.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
7.	.15	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
8.	.20	.06	.09	.11	.04	. . .	.03	. . .	.32	.10	.32	.04	. . .	. . .	.48	.05	.05	. . .	. . .	. . .	.01	. . .	. . .	. . .
9.	. . .	. . .	1.01	. . .	.01	. . .	. . .	. . .	.05	. . .	.07	11	. . .	. . .	.63	. . .	.17	.03	.90	. . .	.55	. . .	.05	.04
10.	. . .	. . .	.02	. . .	. . .	. . .	.26	.10	. . .	.10	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.11	. . .	. . .	. . .	. . .
11.	.32	.50	.76	.34	.85	.70	.18	.20	.50	.10	. . .	.44	. . .	. . .	.72	.32	.84	.31	.26	.22	.20	. . .	1.10	.97
12.	.01	.19	.13	.12	.11	.20	.81	.20	. . .	. . .	.02	.35	.60	.43	.10	.33	.12	1.04	.99	.34	. . .	1.16	.05	.68
13.	. . .	. . .	. . .	. . .	. . .	. . .	.03	. . .	. . .	. . .	.22	.02	.12	. . .	. . .	.15	. . .	. . .	. . .	. . .	.70	. . .	. . .	. . .
14.	.02	. . .	. . .	. . .	. . .	. . .	.30	.14	. . .	. . .	. . .	. . .	.68	.04	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
15.	.12	.36	.16	.10	.53	1.17	.65	1.60	.53	.30	. . .	1.63	.72	.54	.78	1.75	1.18	.76	.56	.92	. . .	.54	.50	.71
16.	.80	. . .	. . .	. . .	. . .	. . .	.09	. . .	.37	.30	. . .	.41	. . .	. . .	. . .	.77	. . .	. . .	. . .	. . .	.16	.04	.25	. . .
17.	.52	.47	1.67	.48	.99	.10	.32	.39	41	.80	.61	1.05	. . .	.05	.51	. . .	.40	.80	.53	. . .	. . .	.14	.84	.04
18.	. . .	. . .	. . .	. . .	. . .	. . .	.04	.02	. . .	. . .	. . .	.07	. . .	.01	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
19.	.04	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.19	. . .	. . .	. . .	. . .
20.	. . .	. . .	. . .	. . .	.01	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
21.	.95	.27	2 68	.35	. . .	.35	.02	.03	.25	2.00	.41	.04	. . .	.01	.75	.22	.22	.21	.11	. . .	.10	. . .	.15	44
22.	. . .	. . .	.01	.10	.65	. . .	.11	.45	. . .	. . .	. . .	.14	.13	.06	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
23.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
24.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
25.	.41	.21	. . .	. . .	.03	.85	.03	. . .	. . .	20	. . .	. . .	. . .	. . .	. . .	. . .	1.00	. . .	. . .	. . .	. . .	. . .	. . .	. . .
26.	.11	1.11	. . .	2.06	1.27	1.00	.94	1.11	.71	.50	.76	1.55	2.25	1.35	1.68	1.30	.90	2.04	1.56	2 10	1 37	1.35	1.75	1.78
27.	. . .	. . .	. . .	.21	. . .	. . .	. . .	. . .	. . .	. . .	.01	. . .	. . .	. . .	. . .	. . .	.01	. . .	. . .	. . .	. . .	. . .	. . .	. . .
28.	. . .	.09	. . .	. . .	.05	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.30	. . .	. . .	. . .	. . .	. . .	. . .	. . .
29.	. . .	.56	.05	. . .	.09	. . .	. . .	. . .	. . .	. . .	. . .	.28	. . .	. . .	. . .	. . .	1.88	. . .	. . .	. . .	.53	. . .	.17	. . .
30.	. . .	.06	. . .	. . .	.12	.23	.06	.11	. . .	. . .	. . .	. . .	.04	.22	. . .	.15	.04	1.15	. . .	. . .	. . .	. . .	. . .	. . .
31.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
	4.86	8.01	8.66	4.99	8.21	6.20	5.38	5.99	4.24	4.80	3.13	7.31	5.48	3.39	7.91	6.41	7.58	7.54	5.82	5.45	4.49	3.86	5.32	5.28

JULY, 1889.

TEMPERATURE.

The mean temperature for July, 1889, was 71°.2, which is about one degree below the normal, and two degrees above the corresponding month of last year. The greatest departures were in the eastern border counties. The mean of the maximum temperatures was 81° 3; and the mean of the minimum 61°.8. The highest temperatures reported were Charlesville, 96°; Hollidaysburg, 95°; Greenville, 95°; Phillipsburg, 94°; Coatesville, 94°; Grampian Hills, 94°; Bethlehem, 94°; New Bloomfield, 94°, and Philadelphia, 94°. These occurred on the 9th and 10th. The lowest temperatures were Coudersport, 39°; New Bloomfield, 40°; Wellsboro', 42°; Columbus, 42°, and Dyberry, 42°.

July is the warmest month of the year, being two degrees warmer than August, and four or five degrees warmer than June. The mean of the three summer months is two degrees less than July.

ISOTHERMAL LINES FOR JULY.

Lines representing places having the same normal temperature are very difficult to trace over the mountain ranges and deep valleys of Pennsylvania. Observations are usually taken at towns in the river valleys, and such deep depressions have a temperature two degrees higher than that of the country back of them. In preparing the accompanying chart an allowance of about one degree was made for such excess. This will explain the lines passing through the northern counties, particularly at places where somewhat higher summer mean temperatures are recorded. In the broader valley of the Susquehanna, the lines may properly be carried sharply along the valley itself.

ATMOSPHERIC PRESSURE.

The barometer averaged slightly above the normal. The highest pressure occurred on the 6th and 7th, and the lowest on the 19th, 20th and 23d.

PRECIPITATION.

The rainfall for July averaged 6.80 inches for the state, which is an excess of from two to three inches.

The month was very humid and tropical in character. Rains were frequent and varied from light to torrential over areas little distant from each other. In many places heavy downpours occurred, which were disastrous, and entirely local in character. On the 30th and 31st very heavy rains occurred over the eastern part of the state, which caused heavy floods. The Schuylkill was reported the highest since the

flood of 1869. Its banks were overflowed, and it is estimated that at one time ten feet of water were flowing over Fairmount dam. The largest totals in inches for the month were: Landsdale, 15.02; Ottsville, 13.19; Coatesville, 12.93; Frederick, 12.69; Pottstown, 12.50; West Chester, 12.49; Smith's Corner, 12.30; Point Pleasant, 12.30. The smallest were Greenville, 1.04; Erie, 1.68, and Columbus, 2.00. The excess of rainfall extended into New Jersey, eastern New York and Connecticut, also Delaware and Maryland.

WIND AND WEATHER.

The prevailing wind was from the west; no severe gales occurred. In some sections large portions of the hay crop were badly damaged during the harvest season by unfavorable weather. Some wheat was injured, and harvesting was generally delayed by frequent rains. The season has been favorable for the growth of all vegetation.

MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for July, 1889.*

COUNTY	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.											
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Allegheny,*	Pittsburgh,	847	29.996	30.245	29.678	74.6	93.3	10	55.5	16	83.8	65.2	18.6	27.5	17	10.7	23
Bedford,	Charlesville,	1,300	. . .	. . .	. . .	70.4	96.0	12	48.0	16	81.3	62.1	19.2	32.0	17	5.0	26
Berks,*	Reading,	304	29.997	30.236	29.723	71.8	92.0	9	50.0	16	82.8	63.	19.	31.0	6	3.0	4
Blair,†	Altoona,	1,181	. . .	. . .	. . .	74.5	93.0	10, 11	55.0	16, 25	84.4	64.	19.	31.0	15	11.0	2
Bradford,	Wysox,	718	29.979	30.277	29.696	69.2	91.2	10	44.5	25	80.8	58.	21.	34.1		8.0	2
Bucks,	Quakertown,	536	29.990	30.220	29.680	70.2	91.7	9	52.7	6	84.1	61.0	23	30	9	7.0	2
Cameron,	Emporium,	1,030	. . .	. . .	. . .	70.0	93.0	10	41.0	25	83.2	56.9	26.	39.0	25	12.0	2
Centre,	State College— Agricultural Experiment Station,	1,191	29.914	30.223	29.405	70.3	89.0	10	57.0	15	80.0	63.	16.	30.0	25	9.0	
Chester,	West Chester,	455	29.962	30.235	29.667	72.6	90.0	9	55.0	16	80.4	65.	14	22.0	16	4.0	
Clarion,	Clarion— State Normal School,	1,530	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Clearfield,	Grampian Hills,	1,450	. . .	. . .	. . .	70.8	94.0	3	52.0	26	80.7	64.	16.	26.0	13	8.	3, 25
Clinton,	Lock Haven,	560	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Columbia,	Catawissa,	490	. . .	. . .	. . .	70.8	91.0	9	52.0	16	. . .	. . .					
Crawford,	Meadville— Allegheny College,	1,050	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .					
Cumberland,	Carlisle,	480	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Dauphin,*	Harrisburg,	361	29.998	30.276	29.706	73.8	92.0	9	57.0	16	81.8	65.8	16.0	26.0	7	7.0	19
Delaware,	Swarthmore— Swarthmore College,	190	29.973	30.210	29.721	73.0	91.1	9	55.8	16	81.8	65.	15.9	28.2	8	5.3	19
Erie,*	Erie,	681	29.980	30.280	29.670	70.0	87.0	9	54.0	15	78.0	63.	15.0	25.0	22	7.0	20
Fayette	Uniontown,	1,000	29.980	30.162	29.724	74.0	89.0	3, 10, 14	52.0	30	82.1	62.	19.7	28.0	7	1.0	26
Fulton,	McConnellsburg,	875	. . .	. . .	. . .	72.0	92.0	9, 10	48.0	10	84.7	60.	23.9	40.0	16	8.0	
Huntingdon,*	Huntingdon - The Normal College,	650	. . .	. . .	. . .	70.3	90.0	8, 9	48.0	16	81.5	60.	21 3	33.0	8	14.0	30
Indiana,	Indiana- State Normal School,	1,350	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Lawrence,	New Castle,	932	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Lebanon,	Myerstown,	474	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Luzerne,	Drifton Drifton Hospital,	1,655	. . .	. . .	. . .	67.1	88.0	9	50.0	16	77.3	60.	16.9	27.0	11, 25	7.0	27
McKean,	Smethport,	1,500	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Mercer,*	Greenville Thiel College,	1,000	29.917	30.156	29.580	69.8	95.0	9	44.6	25	82.8	56.	26.	43.0		10.	15

Montgomery,	Pottstown,	150				74.4	92.0	9	56.0	16	82.0	67.6	14.4	25.0	16	2.0	2
Northampton,	Bethlehem,	360				74.0	94.0	9	54.0	15	83.0	63.0	20.0	32.0	9	5.0	2
Perry,	New Bloomfield,	400				72.7	94.0	9, 10	49.0	25	81.2	59.1	22.1	46.0	25	9.0	31
Philadelphia,*	Philadelphia,	117	30.000	30.269	29.669	73.8	94.0	9	60.0	16	83.1	67.5	15.6	24.0	6	5.0	2
Potter,	Coudersport,	1,670				67.2	89.0	10	39.0	25	80.6	53.8	26.8	39.0	7	13.0	30
Schuylkill,	Girardville,	1,000	29.998	30.214	29.573	72.6	90.0	10	53.0	6	81.0	62.9	18.1	29.0	18	8.0	2
Snyder,	Selinsgrove,	445				74.4	89.0	9	57.0	25	79.9	68.2	11.7	46.0	28	33.0	25
Somerset,	Somerset,	2,250				68.5	89.0	11	45.0	16	79.1	57.9	21.2	35.0	6	9.0	30
Sullivan	Eagles Mere,	2,060	30.019	30.230	29.964	67.5	86.0	10	51.0	16	73.8	62.1	11.7	22.0	6	4.0	19
Tioga,	Wellsboro',	1,327	29.942	30.275	29.642	70.3	90.0	10	42.0	25	80.3	61.1	19.2	34.0	25	14.0	19
Warren,	Columbus,	1,410	30.081	30.372	29.843	68.1	88.0	10	42.0	25	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Wayne,	Honesdale,	1,000	. . .	. . .	. . .	66.4	86.0	10	44.0	25	75.8	57.0	18.8	30.0	18	6.0	20
York,*	York,	385	29.956	30.223	29.702	74.5	95.0	10	52.5	16	83.7	64.8	18.9	29.0	7	6.5	19

* Observations taken at 8 A. M. and 8. P. M. † Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	PRECIPITATION. Number of days rainfall.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	WIND. PREVAILING DIRECTION. 2 P. M.	WIND. PREVAILING DIRECTION. 9 P. M.
Allegheny.*	Pittsburgh.	67.2	61.2	5.48	13	6	10	15	N	N	N
Bedford.	Charlesville.	81.6	64.1	4.19	14	10	13	8	W	W	SE
Berks.*	Reading.	88.7	64.0	9.30	16	12	10	9	NW	NW	NW
Blair,†	Altoona.	60.7	60.0	4.60	12	. . .	. . .	. . .	. . .	. . .	. . .
Bradford.	Wysox.	83.2	64.0	5.17	15	7	12	12	SE	SE	SE
Bucks.	Quakertown.	90.3	68.2	11.54	16	11	9	11	N	NW	SW
Cameron.	Emporium.	73.6	61.0	7.03	10	15	10	6	W	NW	NW
Centre.	State College— Agricultural Experiment Station.	75.2	52.4	4.68	13	12	12	7	W	W	W
Chester.	West Chester.	79.0	96.5	12.49	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Clarion.	Clarion— State Norma' School.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Clearfield.	Grampian Hills.	. . .	. . .	7.33	15	13	10	8	W	SW	W
Clinton.	Lock Haven.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Columbia.	Catawissa.	. . .	. . .	6.62	12	. . .	. . .	. . .	. . .	. . .	. . .
Crawford.	Meadville— Allegheny College.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cumberland.	Carlisle.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Dauphin.*	Harrisburg.	77.8	65.5	8.68	18	7	14	10	E	E	E
Delaware.	Swarthmore— Swarthmore College.	82.0	67.0	8.74	13	11	10	10	NW	NW	W
Erie.*	Erie.	74.0	62.0	1.68	10	15	9	7	SW	SW	SW
Fayette	Uniontown.	76.2	. . .	4.81	12	14	14	3	SW	SW	SW
Fulton.	McConnellsburg.	78.9	68.7	8.23	14	12	16	3	S	S	S
Huntingdon.	Huntingdon— The Normal College.	. . .	. . .	5.38	19	7	8	16	W	W	W
Indiana.	Indiana— State Normal School.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Lawrence.	New Castle.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Lebanon.	Myerstown.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Luzerne.	Drifton - Drifton Hospital.	. . .	. . .	9.55	15	10	11	10	. . .	. . .	. . .
McKean.	Smethport.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Mercer.*	Greenville— Thiel College.	87.9	64.9	1.04	7	11	10	10	SE	. . .	W

Montgomery,	Pottstown,	81.0	75.0	12.50	14	15	6	10	W	W	W
Northampton,	Bethlehem,	78.0	66.0	9.93	12	17	7	7	W	W	W
Perry,	New Bloomfield,	...	...	6.08	14	10	10	11	W	W	W
Philadelphia, *	Philadelphia,	76.3	65.3	8.29	17	6	6	16	NW	NW	NW
Potter,	Coudersport,	79.0	62.5	7.00	7	21	6	4	NW	NW	NW
Schuylkill,	Girardville,	...	...	9.46	14	10	4	17	W	W	W
Snyder,	Selinsgrove,	75.2	68.0	4.29	9	16	6	9	SE	SE	SE
Somerset,	Somerset,	83.1	62.2	5.06	7	15	4	12	NW	NW	NW
Sullivan,	Eagles Mere,	83.2	61.3	6.30	16	8	11	12	NW	NW	NW
Tioga,	Wellsboro',	73.6	52.3	3.06	12	11	8	12	N	N	S
Warren,	Columbus,	78.2	61.0	2.00	8	11	15	5	SW	SW	SW
Wayne,	Honesdale,	...	...	5.55	...	...	...	...			
York, *	York,	72.7	66.3	4.34	8	13	10	8	NW	NW	NW

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

PRECIPITATION FOR JULY, 1889.

	Rte.	New Castle.	Greenville.	Columbus.	Pittsburgh.	Uniontown.	Clarion.	Indiana.	Smethport.	Somerset.	Grampian Hills.	Kempton.	Blue Knob.	Phillipsburg.	Huntingdon.	Hollidaysburg.	Altoona.	Charlesville.	McConnellsburg.	State College.	York.	New Bloomfield.	Carlisle.	Wellsboro'.	Ntabet.	Harrisburg.	
1	.55		.06	.09	.04	.02					.48	.80	.30	.05	.01	.49	.12	.53	.90	.33	.66	.30		.19	.10	.14	
2	.33		.47	.15	.78	.80				1.06	.05	.19	.30	.20	.02	2.83	1.20	.66	.71	.35	1.01	.68		.10	.60	.02	
3			.08		.29						.08	.11	.40	.45	.02	.29	.15	.36	1.04	.10	.02	.08		.06			
4												.30		.13	.25	.19		.33	.55		.05						
5															.06												
6															.02												
7															.01												
8				.03						.42																	
9															.05	.15	.13	.30	.17	.06	.16	.30					
10	.01			.16	.20	.37				.29	.05	.20	.20	.15	.10	.44	.37	.10	.07	.43	.04	.40		.30	.10		
11	.08		.04	.04	.08	.04				.06	.50	.70	.30	.45	.16	.01	.37	.07	.07	.08	.06	.49		.06			
12	.15		.06	.20	.31	.88				.02	1.84	.30		2.03	.30	.33	1.45	.51	.20	1.04	.76	.78		.28			
13	.05		.60	.05	.32	1.93					.04	.40	.40	.14	.09	.42	.14	1.06	.75	.06	.05	.04					
14																		.01		.01		.01					
15						.15					.10			.02				.02	.14								
16											.06				.05			.16		.03							
17					1.41	.02				.45	.80	.87	.50	.55	.70	.37	.29	.30	.13	.65	.01	.15		.74			
18	.02		.01	.01	.12	.21				1.03	.06	.04	.50	.05	1.00	.35	.10	.36	1.71	.10		.05		.12	.50		
19	.01				1.03	.26				.20	.15	.07	.30	.40	.22	.21	.24	.36	1.04	.35		.05		.05	.30		
20						.45				.06		.06	.10		.13	.22	.14		.20	.81		.09			.20		
21																											
22																											
23																											
24																											
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31																											
	1.68	....	1.04	2.00	5.48	4.81	....	....	....	3.01	7.33	7.03	4.70	5.21	5.88	6.22	4.00	4.19	8.25	4.68	4.34	6.05	2.06	5.10	8.68	

PRECIPITATION FOR JULY, 1889—*Continued.*

	Bellingrove.	Kaplen Mere.	Wysox.	Tatamy.	Girardville.	Drifton.	Heading.	Pottstown.	West Chester.	Coatesville.	Dyberry.	Coudersport.	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Selinsgrove.	Frederick.	Ottawville	Smith's Corner	Doylestown.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.	Bethlehem.
1	.37	.65	1.17	1.16	2.00	1.45	.76	2.30	.46	.47	.79	.30	.48	.90	.21	.13			.57				.01			.72
2	.31	.60	.01	.04	1.31	.50	.02	.70	1.08	1.07	.57	2.10	.30	.54	.52	.52			.87							.86
3	.72	.32	.30	.57	.29	.38	.17	.07	.25	1.11	.45		.12	.45	.06	.21		2.30	.68		1.15	2.63	1.40	1.93		.04
4	.10	.22	.03	.05	.33	.35		.02	.65	1.02			.48	.54	.61	.61		.40	.70	2.29	.68		.44	.71	1.90	.80
5																										
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15																										
16	.16	.74	.05	.24	.35	2.10	.90	1.10	.56	.87	.61	.30	.09	.56	.30	.04	.11	1.44	.15	.74	.42	1.15	.93	1.14	.70	1.00
17	.04	.74	.06	.24	.11	.70	.70	1.80	.48	1.02	.11	.60	.12	.63	.30	.25	.03	.53	.24	.30	.04	1.00	.20	.28	.24	.04
18	.05	.24	.09	.06	.34	1.10	.03	2.40	2.05	1.08	1.46	.90	1.50	2.13	1.58	.44	.01	2.48	1.52	.45	1.90	1.94	2.26	1.00	1.40	1.04
19	1.24	.85	1.13	1.13	1.00	1.10	1.80	2.40	1.08	1.08																
20	.03	.50	.03	.06	.25	.15	.06	.05	.14	.30	.96		.29	.05		.01		.34	.79	.06	.16	.43	.18	.16		
21	.24	.24	.03	.24	.13	.24	.03	.05	.91	.08	.97			.45		.33		.33	1.24	.06	.18	.45	.18	.16		
22	.06	.24	.03	.07	.34	.06	.17			.05				.19		.43		.33	.04	.06	.18	.45	.18	.16		
23	.30	.50	.03	.50	.13	.30	.50	.40	.80	.05	.56	1.90	.51	.64	.57	.26		.37	.13	.78	.74	.50	.84	.61	.01	.68
24	.31	.42	.81	.79	.34	.31	.02	.10	.44	.05	.06		.02	.21	.53	.88		.22	.08	.28	.40	.45	.75	.88	.01	.64
25	.42	.81	.79	.78	1.37	.42	.36	.10	.07	.07	.06	1.30	.01	.18	.05	.15		.21	.24	.15	.55	.37	.05	.01	.01	.64
26	.79	.79	.78	.78	1.05	.81	1.40	1.95	1.65	2.80	.91		.05	1.73	.11	1.15		2.08	2.01	1.77	1.77	3.35	4.00	3.44	2.49	2.72
27																										
28																										
29																										
30																										
31																										
	1.24	6.30	5.17	6.02	9.40	9.55	9.30	12.50	12.49	12.93	6.58	7.00	5.55	11.54	8.74	8.29		12.09	13.19	12.30	11.87	15.09	10.36	10.50	12.30	9.93

AUGUST, 1889.

TEMPERATURE.

The mean temperature of the state for the month of August, 1889, was 67°.4, which is two degrees below the corresponding month for 1888, and about three degrees below the normal. The greatest departures were in the agricultural districts of the Lehigh, Cumberland and Lebanon valleys. The following reports show the highest temperatures recorded during the month: Tionesta, 100°; Carlisle, 95°; Girardville, 95°. The lowest were Columbus, 37°; Wellsboro', 38°; Greenville, 38°.7; and Honesdale, 39°.

At most stations the warmest days of the month were the 21st and 31st, and the coldest the 12th. Stations with the highest monthly mean temperatures were Carlisle, 72°.9; Philadelphia, 72°.8; Pottstown, 72°.0 and Selinsgrove, 71°.8. The lowest monthly mean temperatures were Dyberry, 61°.2; Honesdale, 62°.0 and Phillipsburg, 62°.0.

ATMOSPHERIC PRESSURE.

The mean barometer for August was 30.09, which is about .09 above the normal. The highest occurred on the 27th, and the lowest on the 14th. This low pressure was accompanied by severe thunder-storms, and the heaviest rainfall of the month.

PRECIPITATION.

The average rainfall for the state during the month of August was 3.24 inches. Considered as a whole, this is about normal, but the distribution was very uneven, and some parts of the state suffered from drouth. The following are the greatest monthly totals in inches: Philadelphia, 7.07; Catawissa, 6.17; Girardville, 6.03; Pottstown, 5.05; West Chester, 4.43; Reading, 4.46. The least were Wellsboro', 0.83; Charlesville, 1.06; Hollidaysburg, 1.37; Altoona, 1.52, and Pittsburgh, 1.88. With but few exceptions, very little rain fell after the middle of the month. Up to this time showers were frequent.

WIND AND WEATHER.

The prevailing winds were from the west; no severe wind-storms occurred. The weather was generally favorable for agricultural pursuits and the growth of all staple crops, with the exception of potatoes. These have suffered from rot. The corn crop will be large.

Average number.—Rainy days, 8; clear days, 15; fair days, 10; cloudy days, 6.

Monthly Summary of Reports *by Voluntary Observers of the Pennsylvania State Weather Service for August, 1889.*

County.	Station.	Elevation above sea level (feet).	Barometer.			Temperature.											
							Maximum.		Minimum.				Daily range.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Allegheny,*	Pittsburgh,	847	30.076	30.276	29.711	70.2	89.0	31	50.0	12	80.3	60.0	20.3	30.0	31	7.0	9
Bedford,	Charlesville,	1,300	. . .	. . .	. . .	64.9	87.0	31	42.0	12	78.8	53.8	25.0	42.0	31	14.5	14
Berks,*	Reading,	304	30.088	30.302	29.821	67.3	87.0	21	46.0	30	81.1	57.2	23.9	40 0	30	12.5	15
Blair,†	Altoona,	1,181	. . .	. . .	. . .	70.4	88.0	3, 22	52.0	28	80.4	60.4	20.0	26.0	13	11.5	9
Bradford,	Wysox,	718	30.089	30.281	29.878	64.4	86.2	21	39.0	29	78.4	52.7	25.7	44.0	30	13.6	20
Bucks,	Quakertown	536	30.080	30.290	29.750	67.7	87.2	21	45.0	30	80.5	57.6	22.9	38.7	30	14.5	15
Cambria,	Johnstown,	1,184	. . .	. . .	. . .	65.9	86.0	31	45.5	12, 13	78.4	54.5	23.9	34.0	31	14.0	10
Cameron,	Emporium,	1,030	. . .	. . .	. . .	69.2	86.0	30, 31	41.0	29	79.3	52.9	26.4	41.0	30	14.0	15
Centre,	State College— Agricultural Experiment Station,	1,191	30.007	30.305	29.645	66.5	85.0	30	46.0	12, 17	77.1	54.9	22.2	37.0	30	14.0	15
Chester,	West Chester,	455	30.075	30.286	29.753	69.9	86.5	21	53.0	28	70.5	62.0	8.5	27.0	30	6.0	27
Clarion,	Clarion— State Normal School,	1,530	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Clearfield,	Grampian Hills,	1,450	. . .	. . .	. . .	65.6	86.0	31	40.0	12	76.7	57.0	19.7	36.0	31	10.0	15
Clinton,	Lock Haven,	560	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Columbia,	Catawissa,	491	. . .	. . .	. . .	67.0	83.5	21	49.0	21, 30	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Crawford,	Meadville— Allegheny College,	1,050	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cumberland,	Carlisle,	480	. . .	. . .	. . .	72.9	95.0	30	51.5	12	85.4	63.2	22.2	33.0	30	1.5	23
Dauphin,*	Harrisburg,	361	30.106	30.337	29.715	68.6	85.0	21, 31	53.0	28	78.9	60.7	18.2	28.0	30	5.0	23
Delaware,	Swarthmore— Swarthmore College,	190	30.063	30.240	29.770	70.1	87.4	21	54.0	15, 16	79.9	61.9	18.0	29.4	30	8.2	26
Erie,*	Erie,	681	30.080	30.280	29.740	67.0	81.0	19	52.0	12	75.0	60.0	15.0	23.0	7	7.0	9
Fayette,	Uniontown,	1,000	30.061	30.185	29.831	69.1	87.0	21	46.0	12	79.2	57.9	21.3	30.0	31	11.0	14
Forest,	Tionesta,	1,057	. . .	. . .	. . .	62.6	100.0	22	45.0	12	80.6	56.3	24.3	45.0	22	6.0	21
Fulton,	McConnellsburg,	875	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Huntingdon,	Huntingdon— The Normal College,	650	. . .	. . .	. . .	67.6	90.0	31	43.0	12	81.4	53.8	27.6	39.0	27	15.0	2
Indiana,	Indiana— State Normal School,	1,350	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Lawrence,	New Castle,	932	. . .	. . .	. . .	69.9	91 0	31	42.0	29	86.0	51.5	29.3	46.0	31	14.0	5
Lebanon,	Myerstown,	474	30.067	30.265	29.781	68.7	89.1	31	47.1	30	81.2	57.4	23.8	39.2	30	11.0	24
Luzerne,	Drifton— Drifton Hospital,	1,655	. . .	. . .	. . .	64.1	84.0	14	44.0	29	77.8	55.8	22.0	35.0	30	6.0	10

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.											
						MAXIMUM.			MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
McKean,	Smethport,	1,500															
Mercer,*	Greenville—																
	Thiel College,	1,000	30.043	30.307	29.684	63.6	83.9	26	38.7	12	78.8	53.4	25.4	41.0	29	7.1	9
Montgomery,	Pottstown,	150				72.0	88.0	21	50.0	30	81.4	61.5	19.9	36.0	30	12.0	15
Northampton,	Bethlehem,	360				71.1	86.0	21, 31	46.0	30	80.1	59.2	20 9	38.0	30	12.0	3
Perry,	New Bloomfield,	400				67.2	90.0	31	40 0	7	81.2	53.8	27.4	40 0	31	11.0	23
Philadelphia,†	Philadelphia,	11[illegible]	30.096	30.300	29.760	72.8	88.0	22	57.0	28	80.9	64.7	16.2	26.0	30	9.0	26
Potter,	Coudersport,	1,670				65.6	85.0	30	38.0	29	76.3	49 6	26.7	44 0	29	12.0	14
Schuylkill,	Girardville,	1,000	30.105	30.285	29.775	67.9	95.0	2	48.0	12, 28	78 0	56.4	21.6	37.0	2	13.0	3
Snyder,	Selinsgrove,	445				71.8	87 0	21	52.0	12, 30	78 4	62 8	15.6	61.0	26	50.0	16
Somerset,	Somerset,	2,250				62 7	83.0	29	41.0	13	75.2	52 1	23.1	43.0	29	10.0	2
Sullivan,	Eagles Mere,	2,060	30.109	30 337	29.900	64.8	79.0	30	48.0	12, 29	72.2	55.7	16.5	26.0	29	5.0	14
Tioga,	Wellsboro',	1,327	30.055	30.317	29.652	62.5	86.0	21	38.0	30	73.6	51 8	21.8	38.2	30	6.0	14
Warren,	Columbus,	1,410				63 8	92.0	30	37.0	12	78.7	48.8	29.9	52 0	30	7.0	9
Washington,	Canonsburg,	950				67.9	84 0	21, 26	45.0	16	78.1	57 7	20.4	. .	. .	. .	. .
Wayne,	Honesdale,	1,000				62.0	80 0	2, 21	39.0	30	72.3	50.8	21.5	36.0	30	4.0	15
York,*	York,	385	30.074	30.277	29.798	70.2	88.0	31	45.5	18	81.3	58.9	22 4	34.5	18	7.5	7

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

Monthly Summary of Reports—*Continued.*

County.	Station	Relative humidity.	Dew point.	Precipitation. Total inches	Precipitation. Number of days rainfall.	Number of Days. Clear	Number of Days. Fair	Number of Days. Cloudy	Wind. Prevailing Direction. 7 A. M.	Wind. Prevailing Direction. 2 P. M.	Wind. Prevailing Direction. 9 P. M.
Allegheny,*	Pittsburgh,	68.2	57.6	1.88	6	9	15	7	N	. . .	N
Bedford,	Charlesville,	80.9	58.3	1.06	7	16	12	3	SW	W	S
Berks,*	Reading,	90.6	64.3	4.46	8	17	7	. . .	SW	. . .	SW
Blair,†	Altoona,	. . .	. . .	1.52	7	. . .	. . .	. . .	. . .	. . .	. . .
Bradford,	Wyalox,	85.2	58.9	2.07	8	9	10	12	E	W	W
Bucks,	Quakertown,	83.8	62.5	4.76	10	12	13	. . .	SW	NE	SW
Cambria,	Johnstown,	78.0	59.0	3.35	8	24	6	. . .	SE	SE	SE
Cameron,	Emporium,	. . .	. . .	3.23	6	11	19	. . .	NW	NW	W
Centre,	State College—										
	Agricultural Experiment Station,	74.6	57.0	3.15	7	15	13	. . .	W	W	W
Chester,	West Chester,	77.0	62.0	4.43	11	15	12	. . .	W	SW	SW
Clarion,	Clarion—										
	State Normal School,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Clearfield,	Grampian Hills,	. . .	. . .	4.00	13	13	12	. . .	W	W	W
Clinton,	Lock Haven,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Columbia,	Catawissa,	. . .	. . .	6.17	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Crawford,	Meadville—										
	Allegheny College,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cumberland,	Carlisle,	71.2	65.1	2.49	7	14	12	5	S	S	W
Dauphin,*	Harrisburg,	78.3	61.2	3.58	10	15	12	. . .	W	W	W
Delaware,	Swarthmore—										
	Swarthmore College,	79.0	63.0	3.52	8		17	13	NW	NW	NW
Erie,*	Erie,	68.0	57.0	2.26	6			7	SW	SW	SW
Fayette,	Uniontown,	79.5	61.0	3.86	7	18	12	1	NW	NW	NW
Forest,	Tionesta,	. . .	. . .	2.40	4		11	16	W	W	W
Fulton,	McConnellsburg,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Huntingdon,	Huntingdon—										
	The Normal College,	. . .	. . .	1.80	5	18	10	. . .	W	. . .	W
Indiana,	Indiana—										
	State Normal School,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Lawrence,	New Castle,	. . .	. . .	2.28	8	14	9	8	W	W	W
Lebanon,	Myerstown,	83.2	62.5	3.07	6	22		4	W	W	W
Luzerne,	Drifton—										
	Drifton Hospital,	. . .	. . .	4.77	8				. . .	. . .	. . .

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	PRECIPITATION. Number of days rainfall.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	WIND. PREVAILING DIRECTION. 2 P. M.	WIND. PREVAILING DIRECTION. 9 P. M.
McKean.	Smethport.	...	...	...	...	...	...	...	...	...	...
Mercer.*	Greenville—										
	Thiel College.	87.4	56.9	1.83	7	18	4	9	SE	...	SE
Montgomery.	Pottstown.	80.0	64.5	5.05	7	21	3	7	W	W	W
Northampton	Bethlehem.	73.0	62.0	4.10	9	22	4	5	W	W	W
Perry.	New Bloomfield.	...	...	2.75	8	16	8	7	NE	NE	NE
Philadelphia.†	Philadelphia.	72.6	63.0	7.07	12	13	6	12	SW	SW	SW
Potter.	Coudersport.	82.2	59.2	3.80	6	22	5	4	N	N	N
Schuylkill.	Girardville.	...	...	6.03	10	17	12	2	W	W	W
Snyder.	Selinsgrove.	76.7	61.7	6.00	6	20	8	3	NW	NW	SW
Somerset.	Somerset.	87.0	59.2	3.35	6	20	9	2	NW	NW	NW
Sullivan.	Eagles Mere.	77.2	57.2	2.82	7	15	9	7	SW	SW	SW
Tioga.	Wellsboro'.	68.2	50.4	.83	8	10	12	9	N	N	N
Warren.	Columbus.	79.2	54.4	2.37	11	14	14	3	SW	SW	SW
Washington.	Canonsburg.	75.2	58.5	1.64	8	21	7	3	S	SW	SW
Wayne.	Honesdale.	...	...	2.60	...	...	...	...	...	...	...
York.*	York.	76.6	62.0	2.83	8	19	9	3	NW	...	NW

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

PRECIPITATION FOR AUGUST, 1889.

	Erie.	New Castle.	Greenville.	Columbus.	Pittsburgh.	Uniontown.	Tionesta.	Clarion.	Indiana.	Johnstown.	Smethport.	Somerset.	Grampian Hills.	Emporium.	Blue Knob.	Phillipsburg.	Petersburg.	Huntingdon.	Hollidaysburg.	Altoona.
1				.29		.28	.30						.05			.52	.00		.02	.00
2			.03	.04		1.05				.21		.49	.06		.80		.15		.15	.08
3	.61	.47	.19	.04	.06	.42				.05		.49	.05	.15	.70	.02			.01	.33
4		.38	.11	.04	.38	.55	.30			1.08		.07	.03	.44		.20	.30	.46	.33	
5												1.21	.30			.02	.05		.01	.03
6																				
7													.05			.02	.02		.05	
8	.71	.18	.51	1.17						.12			.06	.19	.20	.23	.09	.05	.05	.28
9	.04	.02		.04	.86	.89				.13					.60		.50	.09	.13	
10																				
11																				
12																				
13	.88	.38	.90	.33	.01	.96	1.90			1.67		1.02	2.11	1.75	.40		1.50		.01	.65
14	.01	.15	.03	.03	.35					.06		.07	.65	1.11	.10	.05	.44	.45	.02	.10
15	.01	.25	.06	.04									.09			.06				
16				.04									.02							
17				.01																
18																				
19																				
20		.35		.34	.22	.21	.50			.66			.45	.59	.10	.10				
21																				
22																				
23																				
24																				
25																				
26																				
27																				
28																				
29																				
30																				
31																				
	2.25	2.26	1.83	2.37	1.88	3.86	2.40	..	..	3.95	..	3.35	4.00	3.23	2.40	2.40	3.12	1.80	1.37	1.52

PRECIPITATION FOR AUGUST, 1889—*Continued.*

	Charlesville.	McConnellsburg.	State College	York	New Bloomfield.	Carlisle.	Wellsboro'.	Nisbet.	Harrisburg.	Selinsgrove.	Le Roy.	Eagles Mere.	Myerstown.	Wysox.	Catawissa.	Girardville.	Drifton.	Reading.	Pottstown.
1.																			
2.	.19		.02	.56	1.00	1.50			.50	1.00	.74	.39	.50	.43		.29	.22	1.17	20
3.				.02		.05			.04	.13	.07			.25	.55	.04		.29	1.33
4.	.29		.41	.42	.60	.01	.24		.54	.44	.01	.46	1.08	.58		.08	.57	.50	.60
5.				.21	.05	.25			.28	.05	.65			.08	.41	.01		.07	.10
6.																			
7.																			
8.	.16		.08	.01	.10	.18	.10		.06	.06	.08	.34	.38		.40	.07	.11	.11	.30
9.			.94	.04	.23				.12	.60					.80	.56	.33	.33	
10.																			
11.			.02	.25	.02	.40	.08		.08	3.01	.49	.58	.55	.38	1.20	.24	3.42	1.88	2.50
12.	.26		2.25	.70	.05	.10	.10		.06	.06		.42	.41	.12	2.75	4.05	.04	.11	
13.																			
14.																			
15.	.02																		
16.			.08	.04	.10		.05		.06	.05	.04	.35	.15	.17	.06	.08	.05		.12
17.							.05					.25		.06					
18.							.05												
19.							.16												
20.																			
21.																			
22.	.04		.08	.04	.10											.08	.03		
23.	.10																.05		
24.																			
25.																			
26.																			
27.																			
28.																			
29.																			
30.																			
31.																			
	1.06		3.15	2.83	2.75	2.49	.83		2.68	6.00	2.08	2.82	3.07	2.07	6.17	6.03	4.77	4.46	5.05

PRECIPITATION FOR AUGUST, 1889—*Continued.*

	West Chester.	Coatesville	Dyberry.	Coudersport.	Honesdale	Quakertown.	Swarthmore.	Philadelphia.	Selinsgrove.	Fredericksburg.	Ottsville.	Smith's Corner.	Doylestown.	Tamaqua.	Forks of Neshaminy	Germantown.	Point Pleasant.	Bethlehem.	Canonsburg.
1	.58	.32	.31	.40	.33	.50	.72	.69	.45	.65	.57	.90	.05	.15	.46	.38	.70	.17	.10
2	.13	.82	.02		.07	.08		.03	.37	.35	.31	.13	.11	1.14	1.85	.98	.90	.40	.40
3	.57	.51	.65	1.00	.16	.52	.84	1.02	.39	.38	.05	.57	.34	.40	.41	.14		.04	.15
4	.04	.35			.54	.02		.06	.07	.06	.45	.60	.06		.25	1.00	24	.50	.77
5	.16	.09					.11				.01						.01	.04	
6	.18	.06	.23		.12		.60	.19		.16	.60	.22		.24	.29	.18		.21	.16
7	.20	.34		.70		.22	.04	.17	.23		.16			.37					
8			.07		.03														
9		.46	.91	.80	1.35	1.09	.65	.01	1.41	2.67	2.00	.14	2.56	1.03	1.44	1.72	2.53	1.65	
10	.84			.80		2.21	.02	1.25	1.40		1.41	2.64				1.00		.81	
11			.05			.02		1.54											
12		.06		.60							.04	.06	.20		.05		.07	.03	
13		.07			.05	.05	.84	1.51		.17									
14	.65	.05						.88					.43	.55	.55	1.60		.03	
15	1.65											.33							
16	.03													.48					
17																			
18																			
19																			
20																			
21																			
22																			
23																			
24																			
25																			
26																			
27																			
28																			
29																			
30																			
31																			
	4.43	3.05	2.85	3.40	2.40	4.76	3.52	7.07	4.15	3.83	5.13	4.88	4.28	4.66	5.30	6.60	3.75	4.10	1.64

SEPTEMBER, 1889.

TEMPERATURE.

The mean temperature for the month of September, 1889, deduced from the reports of fifty stations, was 61°.9, which is about one degree above the normal, and two degrees above that of September, 1888. The greatest departures were in the southeastern part of the state. The means of the daily maximum and minimum temperatures were 70°.8 and 53°.0, respectively, making a daily mean of 61°.9, and an average daily range of 17°.8.

The highest temperatures recorded were Columbus, 92°; Lebanon, 91°; Petersburg, 90°; Greenville, 90°; New Castle, 90°, and Pittsburgh, 90°.

The lowest were Phillipsburg, 30°; Clarion, 31°; Petersburg, 31°; New Castle, 31°; Coudersport, 31°; Columbus, 31°, and Dyberry, 31°.

The highest temperature occurred on the 1st and 2d, and the lowest on the 23d.

Frosts were general on the 23d.

Stations with the highest monthly averages were Myerstown, 68°.7; Philadelphia, 66°.4; Pottstown, 65°.0, and Uniontown, 64°.9.

The lowest averages were Dyberry, 57°.2; South Eaton, 57°.5; Phillipsburg, 57°.7; Eagles Mere, 58°.2, and Wellsboro', 58°.4.

BAROMETER.

The average pressure, 30.04, is slightly below the normal. The lowest occurred on the 20th and 21st. The range for the state was about one inch.

PRECIPITATION.

The average precipitation for the state, 5.05 inches, is an excess of 1.50 inches. The greatest departures were in the eastern part of the state, where the following totals in inches were reported: Kennett Square, 10.01; West Chester, 9.95; Eagles Mere, 9.35; Coatesville, 9.12; Forks of Neshaminy, 8.76, and Doylestown, 8 61. The smallest totals Wellsboro', 2.71; Altoona, 2.74; Grampian Hills, 2.76; Emporium, 2.84, and Somerset, 2.94. The heavy rains, from the 10th to the 15th, did not extend to the extreme western part of the state. A few stations reported light snow on the 19th, 20th and 21st.

NOTE.—Observers are particularly requested to enter the time of the beginning and ending of precipitation. Also to note *excessive precipitation.*

Excessive precipitation is an actual fall of 2.50 inches or over in twenty-four hours, or one inch or more in one hour.

WIND AND WEATHER.

The notable West Indian hurricane, which occasioned the destructive floods along the seaboard of New Jersey from the 9th to the 12th, caused high winds and heavy rains throughout the eastern and middle portions of Pennsylvania. The whole month may be characterized as wet and unpleasant. The dampness caused considerable delay in wheat seeding, and rotted potatoes so badly that only a very small crop was secured.

Average Number.—Rainy days, 13; clear days, 8; fair days, 8; cloudy days, 14.

Prevailing Direction of Wind.—West.

MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for September, 1889.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.										
						MAXIMUM.			MINIMUM.				DAILY RANGE.			
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Allegheny,*	Pittsburgh,	847	30.028	30.244	29.495	65.6	90.0	1	44.0	23	73.6	57.5	16.1	29.0	. . .	6.0	. . .
Bedford,	Charlesville,	1,300	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Berks,*	Reading,	304	30.056	30.279	29.636	63.5	84.0	2, 16	42.0	22, 27	73.0	54.1	18.9	34.0	2	8.0	12
Blair,†	Altoona,	1,181	. . .	. . .	. . .	64.4	86.0	6	41.0	23	72.5	56.2	16.3	26.0	1	6.0	15
Bradford,	Wysox,	718	30.049	30.327	29.494	60.2	86.0	3	32.5	23	70.2	50.2	20.0	35.0	3	8.0	17
Bucks,	Quakertown,	536	30.040	30.320	29.510	61.6	84.0	6	36.7	23	72.2	53.5	18.7	34.2	3	4.3	12
Cambria,	Johnstown,	1,184	. . .	. . .	. . .	62.8	85.0	1, 3	42.0	27, 29	71.3	54.3	17.0	30.0	29	10.0	17
Cameron,	Emporium,	1,030	. . .	. . .	. . .	62.9	84.0	3, 4	35.0	23	71.4	50.5	20.9	34.0	29	8.0	17
Centre,	State College—																
	Agricultural Experiment Station,	1,191	30.023	30.298	29.454	60.6	81.0	1, 3	36.0	23	68.3	51.7	16.6	31.0	23	7.0	17
Chester,	West Chester,	455	30.029	30.314	29.515	62.6	84.0	6	42.0	23	70.7	56.6	14.1	25.0	29	4.0	12
Clarion,	Clarion—																
	State Normal School,	1,530	. . .	. . .	. . .	61.8	86.5	1	31.0	23	69.7	50.7	19.0	45.0	1	3.0	21
Clearfield,	Grampian Hills,	1,450	. . .	. . .	. . .	60.4	86.0	1	32.0	23	68.8	54.0	14.8	29.0	3	6.0	20
Clinton,	Lock Haven,	530	. . .	. . .	. . .	62.9	87.0	4	36.0	23	72.1	53.0	19.1	32.0	23	7.0	17
Columbia,	Catawissa,	491	. . .	. . .	. . .	63.3	80.5	1, 16	39.0	23	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Crawford,	Meadville—																
	Allegheny College,	1,550	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cumberland,	Carlisle,	480	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Dauphin,*	Harrisburg,	361	30.068	30.322	29.559	62.6	82.0	16	43.8	23	70.3	57.8	13.0	25.0	23	4.0	17
Delaware,	Swarthmore—																
	Swarthmore College,	190	30.023	30.383	29.615	63.8	85.0	6	41.0	23	72.1	56.4	15.7	29.5	23	3.5	12
Erie,*	Erie,	681	30.032	30.265	29.406	63.0	85.0	2, 15	42.0	23	69.0	56.0	13.0	25.0	29	3.0	16
Fayette,	Uniontown,	1,000	30.000	30.177	27.039	64.9	89.0	1	36.0	23	23.3	55.4	17.9	34.0	23	6.0	6
Forest,	Tionesta,	1,057	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Franklin,*	Chambersburg—																
	Wilson Female College,	618	30.009	30.339	29.597	62.9	86.0	15, 17	34.0	23	71.6	54.2	17.4	35.0	23	6.0	13
Fulton,	McConnellsburg,	875	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Huntingdon,*	Huntingdon—																
	The Normal College,	650	. . .	. . .	. . .	62.6	87.2	1	35.0	23	76.5	53.9	22.0	38.0	28	9.0	25
Indiana,	Indiana—																
	State Normal School,	1,350	. . .	. . .	. . .	61.7	87.6	1	35.0	23	71.1	50.6	20.5	36.7	28	10.0	14
Lancaster,	Lancaster,	413	30.023	30.197	29.621	62.8	87.0	4	39.0	23	71.9	54.7	17.2	38.0	4	6.0	13
Lawrence,	New Castle,	932	. . .	. . .	. . .	63.1	90.0	1, 2	31.0	23	74.1	50.1	24.0	40.0	23	7.0	20

Lebanon,	Myerstown,	474	30.017	30.261	29.551	61.9	87.9	9	36.5	23	72.7	54.4	18.3	34.5	23	5.1	12
Luzerne,	Drifton—																
	Drifton Hospital.	1,655				58.9	78.0	15	40.0	22, 23	67.2	52.7	14.5	28.0	3	7.0	12
Mercer.*	Greenville—																
	Thiel College.	1,000	30.030	30.262	29.426	59.3	90.3	2	33.8	23	73.1	55.3	17.8	37.	7	5.7	30
Montgomery.	Pottstown.	150				65.0	88.0	6	41.0	23	73.0	58.0	15.0	29.	23	3.0	12
Northampton.	Bethlehem.	360				64.0	83.0	6	40.0	29	72.0	56.0	16.0	30.	2	8.0	12
Perry.	New Bloomfield.	400				61.3	88.0	1	34.0	23	72.0	54.0	18.0	39.	23	3.0	17
Philadelphia.	Philadelphia.	117	30.046	30.330	29.380	66.4	87.0	3	47.0	22	73.	59.5	13.9	22.	23	4.0	12
Potter.	Coudersport.	1,670				66.5	88.0	30	31.0	23	69.	47.2	22.5	33.	4	4.0	20
Schuylkill.	Girardville.	1,000	30.066	30.318	29.631	60.3	80.0	16	37.0	23	69.0	52.5	16.5	28.	29	8.0	11
Snyder.	Selinsgrove.	445				63.1	84.0	3	41.0	23	73.0	33.0	40.6	59		28.0	20
Somerset.	Somerset.	2,250				57.0	86.0	1	32.0	23	69.9	50.0	19.9	34.	23	7.0	24
Sullivan.	Eagles Mere.	2,060	30.102	30.438	29.568	58.2	74.0	16	36.0	23	63.	50.5	13.3	22.	23	3.5	19
Tioga.	Wellsboro',	1,327	30.024	30.325	29.439	58.4	88.0	4	30.0	23	69.9	51.1	18.8	18.	1	2.0	4
Warren.	Columbus.	1,410				61.0	92.0	1, 2	31.0	23	72.2	49.8	22.4	46.	1	2.0	16
Washington.	Canonsburg.	950				62.5	88.0	1, 2	36.0	22	73.0	52.0	21.0	40	23	16.0	50
Wayne.	Honesdale.	1,000				60.1	80.0	16	34.0	23	68.0	55.2	12.8	28.	23	5.0	12
Wyoming.*	South Eaton (27 days).	660				57.5	80.1	5	32.0	23	65.2	49.8	15.4	31.	23	3.0	13
York.*	York.	385	30.056	30.340	29.605	63.4	85.0	4	38.5	23	73.4	55.5	17.9	38.	23	5.0	12

*Observations taken at 8 A. M. and 8 P. M. †Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	PRECIPITATION. Number of days rain fall.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	WIND. PREVAILING DIRECTION. 2 P. M.	WIND. PREVAILING DIRECTION. 9 P. M.
Allegheny,*	Pittsburgh,	73.3	54.9	2.87	11	9	9	12	N	N	NE
Bedford,	Charlesville,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Berks,*	Reading,	80.2	63.8	7.08	10	9	5	16	NW	NW	NE
Blair,†	Altoona,	. . .	. . .	2.74	10	. . .	. . .	. . .	. . .	. . .	. . .
Bradford,	Wysox,	84.3	55.1	3.21	13	7	. . .	19	SE	SE	SE
Bucks,	Quakertown,	86.4	57.4	8.06	15	6	10	14	NE	NE	NW
Cambria,	Johnstown,	. . .	. . .	4.59	9	. . .	. . .	. . .	. . .	. . .	. . .
Cameron,	Emporium,	. . .	. . .	2.84	9	5	14	1	W	W	E
Centre,	State College— Agricultural Experiment Station,	76.2	54.2	3.67	14	5		18	W	SW	W
Chester,	West Chester,	81.0	56.5	9.95	18	11		12	N	NW	NW
Clarion,	Clarion— State Normal School,	79.6	53.3	3.32	5	13		11	NE	SW	SW
Clearfield,	Grampian Hills,	. . .	. . .	2.76	14	4		18	W	W	W
Clinton,	Lock Haven,	. . .	. . .	4.73	15	9		16	W	W	W
Columbia,	Catawissa,	. . .	. . .	4.47	11	. . .		. . .			
Crawford,	Meadville— Allegheny College,	. . .	. . .	. . .	. . .	. . .					
Cumberland,	Carlisle,	. . .	. . .	. . .	. . .	. . .					
Dauphin,*	Harrisburg,	80.6	56.2	4.53	17	8		15	W	W	W
Delaware,	Swarthmore Swarthmore College,	82.6	58.6	8.04	11	1	12		NW	SE	SW
Erie,*	Erie,	76.0	54.0	4.85	15	10			S	S	E
Fayette,	Uniontown,	79.4	58.5	3.79	11	12	11		NW	SE	E
Forest,	Tionesta,	. . .	. . .	. . .	. . .	. . .					
Franklin,*	Chambersburg— Wilson Female College,	86.1	57.5	4.13	8	. .					
Fulton,	McConnellsburg,	. . .	. . .	. . .	. . .	. . .					. . .
Huntingdon,	Huntingdon— The Normal College,	. . .	. . .	4.53	9	11	9		W	W	W
Indiana,	Indiana— State Normal School,	81.3	55.9	4.06	17	5	16	9	NE	NE	NE
Lancaster,	Lancaster,	90.9	60.5	6.38	15	5	12	13	SE	W	W
Lawrence,	New Castle,	. . .	. . .	4.01	10	8	12	10	SE	SE	SE
Lebanon,	Lebanon,	87.7	57.3	3.45	15	8	5	17	E	E	E

Luzerne,	Drifton—										
	Drifton Hospital,	...	...	5.56	...	...	...	...	...	...	...
Mercer.*	Greenville—										
	Thiel College,	92.5	56.5	3.68	12	8	7	15	SE	SE	NE
Montgomery,	Pottstown,	84.0	60.0	8.44	9	14	7	12	NE	NE	NE
Northampton,	Bethlehem,	80.0	58.0	6.14	17	14	2	14	W	W	W
Perry,	New Bloomfield,	...	...	5.02	16			17	E	E	E
Philadelphia.*	Philadelphia,	80.0	60.0	4.68	17			17	NE	NE	NE
Potter,	Coudersport,	90.0	56.5	2.90	6			14	W	W	W
Schuylkill,	Girardville,	...	...	6.50	17			21	W	NW	W
Snyder,	Selinsgrove,	79.0	53.0	5.16	10		10	6	SW	SE	SE
Somerset,	Somerset,	83.0	54.0	2.94	10	10	11	9	NW	NW	NW
Sullivan,	Eagles Mere,	80.7	51.8	9.35	14	8		15	SW	SW	SW
Tioga,	Wellsboro†,	69.2	48.3	2.71	14	6	10	14	N	N	N
Warren,	Columbus,	83.1	53.2	5.25	11	10	9	11	SW	SW	SW
Washington,	Canonsburg,	73.0	55.0	3.41	11	10	10	40	SE	NE	SE
Wayne,	Honesdale,	76.0	58.0	4.10	18			...	...	...	
Wyoming,	South Eaton (27 days),	...	...	3.32	11	6		17	N	N	N
York.*	York,	78.3	57	6.87	13	13	3	14	NW	NW	NW

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

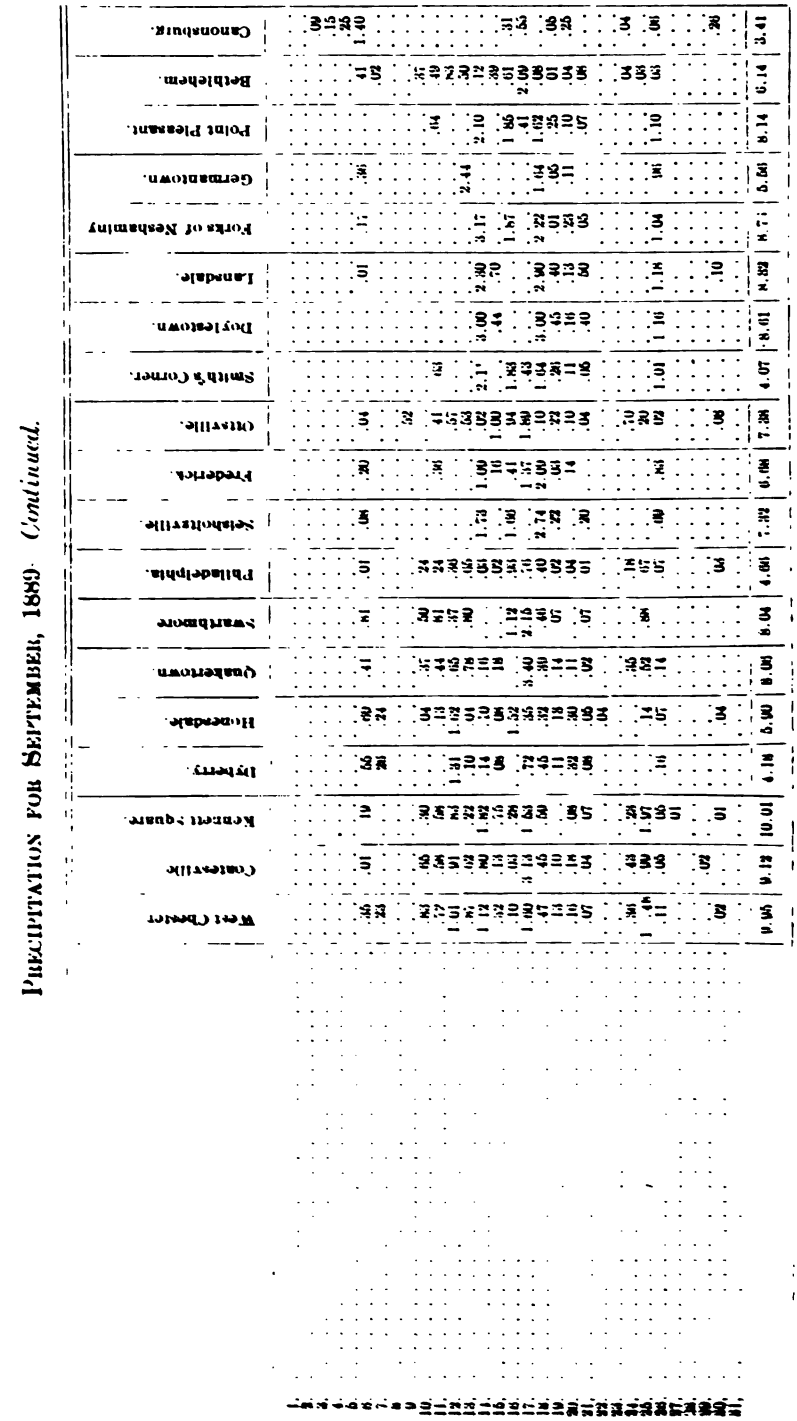
PRECIPITATION FOR SEPTEMBER, 1889.

	Erie	New Castle	Greenville	Columbia	Pittsburgh	Unionto wn	Clarion	Indiana	Johnstown	Somerset	Graupian Hills	Bamford	Blue Knob	Phillipsburg	Peterburg	Huntingdon	Hollidaysburg	Altoona	Chambersburg
1	.12	.11	.07	.20	.15	.07	.24	.16	.92		.05	.73	.20	.20	.36		.25	.12	
2	.15	.28	.17	.58	.07	.56		.22			.50		.20	.40	.41		.34	.05	
3	.73	1.03	.14	1.08	1.33	.84	1.16	1.75			.11		.10	.02	.02			.18	
4	.07		.02					.01		.41									
5	.91									.10									
6																			
7																			
8																			
9												.15	.10	.15	.08	.25	.08		1.20
10												.06	.40	.16	.30	.33	.33		1.10
11												.12	.20	.15	.12	.17	.11		
12												.21	.20	.02	.04	.04	.04		
13												.63	.20	.70	.34	.38	.17		
14													.20	.08	.90	.86			
15												.15	.30	.01		.20	.07	.04	.05
16												.10	.10	.19	.01	.50	.09	.04	.10
17														.15	.01	.65	.06	.04	.06
18																.20	.17	.06	.01
19																.01			
20																.01			
21																			
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31																			
	4.45	4.01	3.48	5.25	2.87	3.79	3.32	4.60	4.59	2.94	2.76	2.84	4.70	2.91	3.57	4.53	3.01	2.74	4.13

PRECIPITATION FOR SEPTEMBER, 1889—*Continued.*

	State College.	York.	Lock Haven.	New Bloomfield.	Wellsboro'.	Harrisburg.	Selinsgrove.	Lancaster.	Le Roy.	Eagles Mere.	Myerstown.	Wyoox.	Catawissa.	Girardville.	Wilkes-Barre.	South Eaton.	Drifton.	Kendlin.	Pottstown.
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	3.67	6.87	4.73	5.02	2.71	4.53	5.16	6.38	3.13	9.35	3.45	3.21	4.47	6.50	5.79	3.32	5.56	7.08	8.44

PRECIPITATION FOR SEPTEMBER, 1889. *Continued.*



OCTOBER, 1889.

TEMPERATURE.

The mean temperature of fifty-nine stations for October, 1889, was 47°.2, which is about 4° below the average, and 1° above the month of October, 1888. The means of the daily maximum and minimum temperatures were 57°.3 and 37°.3, respectively. These give a mean temperature of 47°.3, and an average daily range of 20°.0. The stations that recorded the highest temperatures during the month were Coatesville, 83°; Annville, 82°; West Chester, 80°; Lancaster, 80°, and Westtown, 80. These occurred on the 12th.

The lowest were Wellsboro', 13°; Dyberry, 14°; Columbus, 14°, and Phillipsburg, 14°. These occurred on the 24th, and are 3° below the coldest temperatures generally reached in October.

Total deficiency in temperature during October, at Pittsburgh, 103°.

Total deficiency in temperature during October, at Philadelphia, 110°

Total excess in temperature since January 1, at Pittsburgh, 90°.

Total excess in temperature since January 1, at Philadelphia, 222°.

BAROMETER.

The mean barometer for the month, 30.08, is slightly above the average. The highest pressure occurred on the 23d, and the lowest on the 1st and 27th.

The extreme range was about nine-tenths (.9).

PRECIPITATION.

The average rainfall for the month was 3.85 inches, which is nearly normal. There was a small excess in the eastern portion of the state, and a small deficiency in the western.

The largest totals in inches were Eagles Mere, 8.61; Reading, 5.74; Drifton, 5.74; Wellsboro', 5.61; Westtown, 5.73; Swarthmore, 5.29, and Quakertown, 5.23.

General rain-storms took place on the 1st, 6th, 12th, 13th, 14th, 22d, 23d, 26th, 27th, 28th and 31st.

The heaviest rainfall during the month was on the 27th.

There was a heavy hail-storm in several sections on the 1st, and first general snow occurred on the 23d. The quantity that fell was small and soon melted.

Total deficiency in precipitation during the month, at Pittsburgh, 0.56 inches.

Total excess in precipitation during the month, at Philadelphia, 0.93 inches.

Total excess in precipitation since January 1, at Pittsburgh, 3.00 inches.

Total excess in precipitation since January 1, at Philadelphia, 8.81 inches.

WIND AND WEATHER.

No severe gales passed over the state during the month. The weather was cold and wet.

Average number.—Rainy days, 10; clear days, 8; fair days, 9; cloudy days, 14.

Prevailing direction of wind.—Northwest.

Monthly Summary of Reports *by Voluntary Observers of the Pennsylvania State Weather Service for October, 1889.*

County.	Station.	Elevation above sea level (feet).	Barometer.			Temperature.											
							Maximum.		Minimum.				Daily Range.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Adams,*	Gettysburg (24 days)	624				49.7	79.0	12	26.0	24	58.4	40.4	18.0	44.0	12	4.0	24
Allegheny,*	Pittsburgh	847	30.088	30.392	29.707	51.0	75.0	11	30.0	24	59.3	42.7	16.6	33.0	19	2.0	18
Bedford	Charlesville	1,300				47.2											
Berks,*	Reading	304	30.051	30.405	29.664	49.8	75.0	1	27.0	22	60.3	39.3	21.0	36.0	17	6.0	31
Blair,†	Altoona	1,181				51.2	71.0	2, 11	26.0	24	59.9	42.6	17.3	29.0	13	6.0	27
Bradford	Wysox	718	30.074	30.488	29.624	43.7	70.5	1	16.0	24	53.9	34.4	19.5	39.0	19	3.5	13
Bucks	Quakertown	536	30.050	30.390	29.560	47.4	77.5	12	26.5	25	59.4	37.4	22.0	37.0	12	8.5	31
Cambria	Johnstown	1,184	30.076	30.370	29.723	47.1	73.0	3, 11	21.0	24	58.8	37.5	21.3	38.0	19	5.0	29
Cameron	Emporium	1,030				46.3	69.0	11	15.0	24	56.8	35.9	22.9	45.0	19	9.0	31
Carbon,*	Mauch Chunk (19 days)	550				46.8	74.5	20	24.0	24	56.3	37.3	19.0	37.5	17	4.5	31
Centre	State College—																
	Agricultural Experiment Station	1,191	30.032	30.404	29.507	46.0	72.0	11	20.0	24	54.6	37.3	17.3	31.0	19	4.0	30
Chester	West Chester	455	30.028	30.372	29.541	49.9	80.0	12	28.0	24	59.6	41.7	17.0	29.5	17	7.0	29
Clarion	Clarion—																
	State Normal School	1,380				45.8	71.5	11	19.0	24	55.3	35.6	19.7	38.0	11	1.0	30
Clearfield	Grampian Hills	1,450				45.0	70.0	11	20.0	26	50.9	38.1	12.8	36.0	5	2.0	13
Clinton	Lock Haven	560															
Columbia	Catawissa	491				48.0	70.0	1	25.0	24							
Crawford	Meadville—																
	Allegheny College	1,050															
Cumberland	Carlisle	480				50.1	78.0	11	22.5	24	61.9	41.9	20.0	36.0	17	4.5	30
Dauphin,*	Harrisburg	361	30.080	30.431	29.526	50.1	76.0	11	29.0	24	57.8	42.5	15.3	34.0	11	3.0	28
Delaware	Swarthmore—																
	Swarthmore College	190	30.027	30.355	29.641	50.1	79.3	12	32.0	24	59.7	41.3	18.4	41.3	12	7.9	29
Erie,*	Erie	681	30.090	30.480	29.580	46.0	69.0	3	30.0	24	52.0	40.0	12.0	27.0	3	3.0	29
Fayette	Uniontown	1,000	30.008	30.258	29.684	50.1	75.0	5	25.0	24	58.3	41.2	17.1	38.0	5	3.0	29
Forest	Tionesta	1,057															
Franklin,*	Chambersburg—																
	Wilson Female College	618	30.110	30.394	29.763	47.9	78.0	11	23.0	24	58.1	37.1	21.0	40.0	17	8.0	29
Fulton	McConnellsburg	875				48.2	77.0	11, 12	26.0	9	60.4	37.7	22.7	42.0	11	7.0	30
Huntingdon,*	Huntingdon—																
	The Normal College	650				46.6	76.0	11	18.0	24	60.4	36.2	24.2	43.0	11	5.0	30
Indiana	Indiana—																
	State Normal School	1,350				47.1	72.6	11	21.3	24	60.0	31.0	29.0	39.6	14	10.0	30
Lancaster	Lancaster	413	30.062	30.364	29.627	49.7	80.0	12	27.0	24	59.5	39.3	20.2	37.0	11	6.0	30

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER.			TEMPERATURE.											
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least	Date.
Lawrence,	New Castle,	932				48.0	73.0	11	17.0	24	56.7	35.0	21.7	43.0	19	6.0	30
Lebanon,	Myerstown,	474	30.018	30.342	29.585	47.8	76.0	12	26.8	24	63.3	38.5	24.8	34.0	11	5.9	30
Lehigh,	Centre Valley,	348				53.5	82.0	12	30.0	24	65.0	40.0	25.0	42.0	19	4.0	28
Luzerne,	Drifton—																
	Drifton Hospital,	1,655				45.0	68.0	1	26.0	24	55.	36.5	18.6	30.0		9.0	13
Lycoming,*	Nisbet,	550				45.1											
Mercer *	Greenville																
	Thiel College,	1,000	30.001	30.347	29.598	42.2	74.0	11	19.3	24	55.6	35.6	20.0	38.3	19	5.0	30
Montgomery,	Pottstown,	150				51.0	79 0	12	30.0	24	59.0	43.0	16.0	31.0	17	5.0	14
Northampton,	Bethlehem,	390				51.0	73.0	1	28.0	24	59.0	40.0	19.0	33.0	17	4.0	6
Perry,	New Bloomfield,	400				47.4	75.0	12, 20	20.0	24	58.7	36.3	22.4	39.0	17	6 0	31
Philadelphia,*	Philadelphia,	117	30.056	30.400	29.560	52.8	79.0	12	32.0	23	60.1	45.4	14.7	26.0	12	4.0	13
Potter,	Coudersport,	1,670															
Schuylkill,	Girardville,	1,000	30.062	30.424	29.679	46.5	70.0	1, 12	25.0	24	56 3	38.0	18.3	30.0	1	7.0	31
Snyder,	Selinsgrove,	445				48.9	69.0	20	22.0	24	61.	32.	29.0	47.0	11	10.0	30
Somerset,	Somerset,	2,250				44.6	73.0	12	17.0	24	57.	34 2	22.9	38.0	20	9 0	7
Sullivan,	Eagles Mere,	2,000	30.119	30.520	29.643	41.7	66.0	27	18.0	24	47.	34.7	12.8	24.0	24	3.	29
Tioga,	Wellsboro',	1,327	30.060	30.444	29.540	40.9	65.0	19	14.0	24	50.	31.8	19.0	34.0	24	2.	30
Union,*	Lewisburg,	450				44.2	69.0	20	20.0	24	54	34.2	19.9	41.0	21	10.	13
Warren,	Columbus,	1,410				43.0	68.0	16	14.0	24	52.3	33.7	8.6	42 0	16	2 0	28
Washington,	Canonsburg,	950				45.0	47.0	11, 12	23.0	24	60.0	35.5	24.5	40.0	11	6.0	30
Wayne,	Honesdale,	1,000				45.4	68.0	12	18.0	24	54.0	36.7	17.3	36.0	19	0	29
Wyoming,*	South Eaton,	660				45.0	70.0	1	20.5	24	54	35.3	9.	27.5	24	0	29
York,*	York,	385	30.049	30.402	29.744	49.9	80.0	12	27.5	24	62.	39.3	22.8	38.0	12	6.0	30

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	Total snowfall during month.	Depth of snow on ground at end of month.	Number of days rainfall.	NUMBER OF DAYS Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Adams,*	Gettysburg (24 days),	. . .	. . .	4.16	1.50	. . .	10	7	2	22	NE	. . .	SE
Allegheny,*	Pittsburgh,	75.8	41.3	2.06	. . .	. . .	14	7	14	14	N	N	N
Bedford,	Charlesville,	79.2	41.6	. . .	. . .	. . .	. . .	6	17	8	W	N	NW
Berks,*	Reading,	90.6	47.0	5.74	. . .	. . .	11	7	11	13	NW	NW	NW
Blair,†	Altoona,	65.4	39.1	2.38	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Bradford,	Wysox,	82.7	38.0	3.16	. . .	. . .	9	10	2	19	NW	NW	NW
Bucks,	Quakertown,	80.0	40.9	5.23	. . .	. . .	17	4	15	12	NE	NE	N
Cambria,	Johnstown,	. . .	. . .	2.55	1.00	. . .	13	8	13	10	NW	NW	NW
Cameron,	Emporium,	. . .	. . .	3.70	. . .	. . .	7	9	8	14	W	N	NW
Carbon,*	Mauch Chunk (13 days),	. . .	. . .	4.95	. . .	. . .	8	. . .	. . .	. . .	. . .	. . .	. . .
Centre,	State College— Agricultural Experiment Station,	75.3	38.0	3.36	. . .	. . .	12	4	15	12	W	W	W
Chester,	West Chester,	71.0	41.2	4.97	. . .	. . .	14	13	4	14	N	NW	NW
Clarion,	Clarion— State Normal School,	78.3	39.0	2.17	. . .	. . .	2	9	8	14	SW	NW	SW
Clearfield,	Grampian Hills,	. . .	. . .	3.21	. . .	. . .	9	8	10	13	W	W	W
Clinton,	Lock Haven,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Columbia,	Catawissa,	. . .	. . .	2.82	. . .	. . .	9	. . .	. . .	. . .	. . .	. . .	. . .
Crawford,	Meadville— Allegheny College,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cumberland,	Carlisle,	82.7	41.9	3.75	. . .	. . .	. . .	7	12	12	W	N	N
Dauphin,*	Harrisburg,	79.6	42.2	3.33	. . .	. . .	13	7	11	13	N	N	N
Delaware,	Swarthmore— Swarthmore College,	77.0	42.6	5.29	. . .	. . .	7	1	9	21	NW	NW	NW
Erie,*	Erie,	75.0	38.0	3.37	. . .	. . .	12	7	9	15	SW	SW	SW
Fayette,	Uniontown,	79.0	44.0	3.31	. . .	. . .	10	12	14	5	NW	NW	NW
Forest,	Tionesta,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Franklin,*	Chambersburg— Wilson Female College,	82.4	43.4	3.24	. . .	. . .	5	8	9	14	. . .	. . .	. . .
Fulton,	McConnellsburg,	76.9	41.0	3.14	.50	. . .	6	11	9	11	W	W	W
Huntingdon,	Huntingdon— The Normal College,	. .	. . .	3.67	1.00	. . .	11	13	9	9	W	W	W
Indiana,	Indiana— State Normal School,	79.2	43.7	3.52	. . .	. . .	11	5	11	15	NW	N	NW

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION				NUMBER OF DAYS			WIND.		
				Total inches.	Total snowfall during month.	Depth of snow on ground at end of month.	Number of days rainfall.	Clear.	Fair.	Cloudy.	PREVAILING DIRECTION.		
											7 A. M.	2 P. M.	9 P. M.
Lancaster,	Lancaster,	89.0	46.9	3.88	. . .	. . .	13	6	14	11	W	W	W
Lawrence,	New Castle,	. . .	. . .	1.88	. . .	. . .	5	6	9	16	W	W*	W
Lebanon,	Myerstown,	84.9	43.6	4.47	. . .	. . .	14	6	6	19	NW	NW	NW
Lehigh,	Centre Valley,	. . .	. . .	3.09	. . .	. . .	13	3	18	10	N	NW	NW
Luzerne,	Drifton—												
	Drifton Hospital,	. . .	. . .	5.74	. . .	. . .	9	. . .	. . .	. . .	NW	NW	NW
Lycoming,*	Nisbet,	. . .	. . .	4.20	. . .	. . .	9	. . .	. . .	. . .	. . .	. . .	. . .
Mercer,*	Greenville—												
	Thiel College,	94.1	40.7	2.74	. . .	. . .	10	7	6	18	NE	NE	NE
Montgomery,	Pottstown,	76.0	43.8	4.56	. . .	. . .	11	9	8	14	NW	NW	NE
Northampton,	Bethlehem,	75.0	44.0	3.29	. . .	. . .	8	17	2	12	W	W	SE
Perry,	New Bloomfield,	. . .	. . .	4.35	1.00	. . .	8	8	8	15	W	W	W
Philadelphia,*	Philadelphia,	72.0	41.0	3.76	. . .	. . .	13	10	7	14	NW	NW	NW
Potter,	Coudersport,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Schuylkill,	Girardville,	. . .	. . .	4.41	. . .	. . .	12	10	9	12	NW	NW	NW
Snyder,	Selinsgrove,	74.8	41.0	3.65	. . .	. . .	12	4	15	12	NW	NW	NW
Somerset,	Somerset,	87.9	39.9	2.61	. . .	. . .	10	8	11	11	NW	NW	NW
Sullivan,	Eagles Mere,	80.2	35.0	8.61	.50	. . .	12	6	11	14	NW	SW	SW
Tioga,	Wellsboro',	73.2	32.4	5.61	. . .	. . .	14	6	10	15	N	N	N
Union,*	Lewisburg,	. . .	. . .	3.04	. . .	. . .	6	8	10	13	NE	NE	NE
Warren,	Columbus,	. . .	. . .	3.44	. . .	. . .	12	8	5	18	N	N	N
Washington,	Canonsburg,	80.4	33.6	2.87	. . .	. . .	16	13	10	8	SW	SE	SE
Wayne,	Honesdale,	63.3	41.3	4.02	. . .	. . .	9	. . .	. . .	. . .	. . .	. . .	. . .
Wyoming,*	South Eaton,	. . .	. . .	4.11	. . .	. . .	12	9	5	17	N	N	N
York,*	York,	76.7	43.0	4.08	. . .	. . .	9	12	9	10	NW	NW	NW

*Observations taken at 8 A. M. and 8 P. M. †Observations taken at 12 noon.

PRECIPITATION FOR OCTOBER, 1889.

	Erie.	New Castle.	Greenville.	Columbus.	Pittsburgh.	Uniontown.	Clarion.	Indiana.	Johnstown.	Somerset.	Gramplan Hills.	Emporium.	Blue Knob.	Phillipsburg.	Petersburg.	Huntingdon.	Hollidaysburg.	Altoona.	Chambersburg.	State College.	York.
1	.45		.43	.56	.04			.30	.10	.22	.06	.70	.50	.35	.13	.17	.11	.12		.32	
2		.08	.04	.08				.12					.10	.70				.21			
3	.08			.18																	
4				.01																	
5					.04		.62				.18					.13		.25			
6	.08		.07	.13	.01	.20			.15	.20		.24	.10	.08	.70		.18			.13	
7	.14	.05	.02	.12	.03	.05		.05	.03	.08			.10								
8					.02								.10								
9																					
10															.10			.03			
11				.02										.05				.03		.01	
12	.84	.60	1.23	.71	.60	.10		.43	.16	.12	.80	.83		.05		.20	.15		.20	.45	
13					.09	.20	1.55	.51	.29	.33		.57	.50	.45	.20	.40	.29	.25	.60	.21	
14	.14				.04	.16			.02	.06	.05		.20	.15				.12		.03	1.38
15																.02					.35
16																					
17																					
18																					
19																					
20																					
21																					.10
22					.20	.52			.25		.18		.10			.35	.28		.90	.32	.10
23					.08	.34		.31	.24	.21			.50	.39	.02		.33	.23		.10	.80
24																					
25	.01		.12																		
26	.05	.60	.24	.30	.22	.28			.24	.80	.42				.25	.60	.38			.38	.40
27	.50		.25	.85	.18	1.00		.87	.76	.50	.64	.55	1.40	.85	1.18	1.55	1.00	.32	1.40	1.09	.75
28	.24	.55	.19	.33	.31	.46			.15	.09	.28	.53	.50	.45		.15	.03	.68		.20	.05
29	.01							.85	.01												
30																					
31	.13		.15	.15	.20			.08	.15			.28	.20	.07	.16	.10	.15	.14	.14	.12	.10
	3.37	1.88	2.74	3.44	2.06	3.31	2.17	3.52	2.55	2.61	3.21	3.70	4.30	3.54	4.34	3.67	2.90	2.38	3.24	3.36	4.03

PRECIPITATION FOR OCTOBER 1889—*Continued*

	Lock Haven.	New Bloomfield.	Wellsboro'.	Harrisburg.	Bellmagrove.	Lancaster.	Le Roy.	Eagles Mere.	Myerstown.	Wyoox.	Catawisan.	Girardville.	Wilkes-Barre.	South Eaton.	Drifton.	Reading.	Pottstown.	West Chester.	Coatesville.	Kennett Square.	Dyberry.
1.		.15	1.46	.22	.30	.10	.56	1.48	.52	.25	.36	.26	.33	.34	.88	.38	.12	.07	.05	.90	.86
2.			.05	.01			.01														
3.																					
4.			.08		.05	.06	.16	.34	.11	.38	.15	.16	.32	.30	.19	.15	.12	.10	.06	.02	.57
5.			.16	.02										.10				.03			
6.																					
7.																					
8.								.28		.06		.04	.04	.05							.06
9.			.05	.03	.02	.03	.09	.02	.01		.02	.02									
10.		.06	.46	.33	.05	.40	.06	1.01	.36	.91	.05	.01	.01	.23	.90	.05	.20	.09	.08	.04	.65
11.		.64	.16	.25	.03	.38	.05	1.32	.43	.10	.60	.02	.03	.34	.32	.10	.10	.11	.33	.79	.38
12.		.15		.05	.03	.32	.30		.31			.30	.30	.22			.22	.45	.30	.04	
13.																					
14.																					
15.																					
16.																					
17.																					
18.																					
19.																					
20.																					
21.				.04	.02	.30	.19	.06	.09	.09	.10	.07	.10	.10	.10	.85	.40	.35	.32	.26	.10
22.				.14	.02	.05			.25							.43		.08	.06	.01	
23.				.08	.43	.67			.13									.02	.55	.73	
24.																					
25.				.06	.90	.51	.25	.46	.70	.64	.55	.84	.68	.68	.54	.42	.50	.28	.30	.19	.25
26.			.10	.06	.50	.82	1.01	1.00	1.03	1.88	.75	1.48	1.75	1.55	2.08	1.83	1.70	1.83	1.99	2.25	1.08
27.			2.10			.05	.06	.96	.04		.02	.13			.22	.92		.14	.02	.19	.35
28.			.40																		
29.																					
30.			.04	.03	.10	.09	.04	.20	.09	.04	.23		.09	.11	.51	.09	.18	.08	.07	.01	.26
31.																					
		4.35	5.61	3.33	3.65	3.88	4.73	8.61	4.47	3.84	2.82	4.41	3.16	4.11	5.74	5.74	4.56	4.97	4.61	5.04	4.01

Precipitation for October, 1889—*Continued.*

	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Selsholtzville.	Frederick.	Ottsville.	Smith's Corner.	Doylestown.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.	Bethlehem.	Canonsburg.	Carlisle.	Centre Valley.	McConnellsburg.	Westtown.	Lewisburg.
1.	.50	.35	.14	.16	.23	. . .	.10	.23	.25	.60	.27	. . .	.01	.01	.05	.08	. . .	.15	. . .	.03
2.	. . .	. . .	. . .	. . .	.08	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.02	. . .	. . .	. . .	. . .
3.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
4.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
5.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.02	. . .	. . .	. . .	. . .	. . .
6.	.49	.15	. . .	. . .	.32	. . .	.23	.18	.16	. . .	.08	. . .	.17	.02	.01	. . .	. . .	. . .	.10	. . .
7.	. . .	.01	. . .	.01	. . .	.13	. . .	. . .	. . .	.30	. . .	. . .	. . .	. . .	.03	. . .	. . .	. . .	. . .	. . .
8.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
9.	. . .	. . .	. . .	. . .	. . .	. . .	.02	. . .	. . .	. . .	.03	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
10.	.08	.02	.03	. . .	. . .	. . .	. . .	.02	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
11.	. . .	.01	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
12.	1.05	.46	. . .	.04	.62	.55	.54	.55	1.01	.18	. . .	. . .	.62	.57	.55	. . .	.44	. . .	. . .	. . .
13.	.07	.20	. . .	.12	. . .	. . .	.23	. . .	. . .	. . .	.43	. . .	. . .	. . .	.05	.24	.08	.46	. . .	.70
14.	. . .	.34	.47	.39	.55	. . .	.58	. . .	. . .	.85	. . .	. . .	. . .	.41	.05	.67	.23	.20	. . .	.25
15.	. . .	.34	1.24	.83	.18	.82	. . .	.59	.73	. . .	.80	. . .	.59	. . .	. . .	. . .	.16	. . .	1.45	. . .
16.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	1.42	. . .
17.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
18.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
19.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
20.	. . .	.05	. . .	. . .	. . .	. . .	.53	. . .	. . .	. . .	. . .	. . .	. . .	.09	. . .	. . .	. . .	. . .	. . .	. . .
21.	.09	.46	.26	.19	.21	.57	. . .	.56	.41	.35	.24	. . .	.60	. . .	. . .	. . .	. . .	. . .	. . .	. . .
22.	. . .	.04	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.36	.35	. . .	.18	. . .	. . .	.23
23.	. . .	.22	.51	.32	.21	.34	.18	.27	.04	.41	.38	. . .	.29	. . .	.35	.85	. . .	.91	.40	. . .
24.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.13	. . .	. . .	. . .
25.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.03	. . .	. . .	. . .	. . .	. . .
26.	.50	.22	. . .	.15	. . .	. . .	1.98	. . .	. . .	. . .	.01	. . .	. . .	. . .	.32	.26	. . .	. . .	. . .	.30
27.	1.03	2.14	2.64	1.45	. . .	1.93	.60	. . .	2.45	1.85	2.01	. . .	2.60	2.03	.45	1.26	. . .	1.20	. . .	1.53
28.	. . .	.07	. . .	.06	1.63	.06	. . .	2.40	. . .	. . .	.05	. . .	. . .	. . .	.12	.30	1.70	. . .	2.00	. . .
29.	. . .	. . .	. . .	.02	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.03	. . .	.04	. . .	. . .	. . .
30.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.48	. . .	. . .	. . .	.10	.22	. . .	. . .	. . .	. . .	. . .
31.	.21	.15	. . .	.02	.14	.22	.15	.19	.22	. . .	.12	. . .	.18	. . .	.24	.07	.13	.22	. . .	. . .
	4.02	5.23	5.29	3.76	5.17	4.62	5.09	4.99	4.27	5.02	4.42	. . .	5.06	3.29	2.87	3.75	3.09	3.14	5.37	3.04

NOVEMBER, 1889.

TEMPERATURE.

The mean temperature of sixty-six stations for the month of November, was 41°.9, which is from 2° to 3° above the normal, and the same as that of November, 1888. The mean of the daily maximum and minimum, 48°.8 and 34°.7, gives a mean temperature of 41°.8, and an average daily range of 14°.1.

The highest temperatures reported during the month were Greensburg, 73°; Annville, 71°, and Centre Valley, 71°. The lowest were Dyberry, 10°; Somerset, 10°; Coudersport, 10°; Lock Haven, 12°; Wellsboro', 12°, and Columbus, 12°. The warmest period of the month was on the 1st, 2d and 3d, and the coldest on the 17th and 30th.

Total excess in temperature during November at Philadelphia, 112°.

Total excess in temperature during November at Erie, 82°.

Total excess in temperature since January 1st at Philadelphia, 334°.

Total excess in temperature since January 1st at Erie, 181°.

BAROMETER.

The mean pressure for the month, 30.08, is about .02 above the normal. The highest, 30.690, occurred at Philadelphia on the 16th, and the lowest, 29.370, at Erie on the 22d.

PRECIPITATION.

The average precipitation for the state was 6.72 inches, which is double the usual quantity for November. As there was only a slight excess in the northwestern portion of the state, this ratio was more in other parts. The greatest totals were Girardville, 10.16; Meyerstown, 9.99; West Chester, 9.91; Eagles Mere, 9.27; Pottstown, 9.15, and Lancaster, 9.02 inches. Excessive rains occurred on the 18th and 19th, which caused heavy freshets along the Susquehanna, that carried away railroad bridges and rafts of lumber.

The snow fall during the month was light.

Total excess in precipitation during November at Philadelphia, 3.02 inches.

Total excess in precipitation during November at Erie, 20.2 inches.

Total excess in precipitation since January 1st at Philadelphia, 12.33 inches.

Total excess in precipitation since January 1st at Erie, 5.02 inches.

WIND AND WEATHER.

The prevailing wind was from the west.

The month may be characterized as warm and wet, with an unusual number of cloudy and unpleasant days.

Average number.—Rainy days, 15; clear days, 5; fair days, 8; cloudy days, 17.

MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for November, 1889.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE.										
							MAXIMUM.		MINIMUM.				DAILY RANGE.			
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Adams.*	Gettysburg	624				40.6	66.0	1	20.5	17	44.1	34.0	10.1	33.0	7		
Allegheny.*	Pittsburgh	847	30.080	30.647	29.448	43.5	69.0	2	20.0	30	49.7	37.3	12.4	25.0	24	0	23
Bedford	Charlesville	1,300				39.5	64.5	24	16.5	30	46.7	30.7	16.0	42.0	24	3.0	
Berks.*	Reading	304	30 080	30.577	29.454	42.8	67.0	3	18.0	17	50.4	35.2	15.2	29.0	3	7.0	9
Blair.†	Altoona	1,181				45.2	62.0	2, 3	25.0	17	52.7	38.8	13.9	23.0	24	6.0	14
Bradford	Wysox	718	30.090	30 697	29.339	39.0	60.4	2	13.0	17	45.	31 9	13.4	30.5	4	3.0	13
Bucks	Quakertown	536	30.070	30 610	29.430	42.4	64.0	3	22.0	16	51.	35.0	16.4	28.2	12		8
Cambria	Johnstown	1,184	30.080	30.615	29.550	41.4	67.0	1	19.0	30	49.	34.7	15.2	31.0	24	0	20
Cameron	Emporium	1,080				41.7	60.0	2, 3	15.0	17	48.	32.5	16.0	32.0		5.0	13
Carbon.*	Mauch Chunk	550				42.7	67.0	4	22.0	28	50.	35.3	4.8	32.0		5.5	8
Centre	State College—Agricultural Experiment Station	1,191	30.049	30.663	29.372	39.5	60.0	1, 2	17.0	17		33.2	8.0	26.0	24	3.0	13
Chester	West Chester	455	30.074	30.668	29.431	43.7	63.5	1, 3	23.0	17	50.	37 2	13.7	28.0		3.5	8
Clarion	Clarion—State Normal School	1,530				43.0	66.0	2	16.0	29	57.	28.	28.6				
Clearfield	Grampian Hills	1,450				38.2	58.0	1, 2	10.0	30	43.	33.	10.2	26.	24	2.0	29
Clinton	Lock Haven	560				43.0	62.0	1	12.0	17	48	33.0	4.0	1.		2.0	20
Columbia	Catawissa	491				44.3	67.0	19	21.5	17							
Crawford	Meadville—Allegheny College	1,050															
Cumberland	Carlisle	480				42.6	63.0	1	21.5	17	50.	36.0	14.	35.	7	3.0	8
Dauph .*	Harrisburg	361	30.114	30.687	29.490	42.4	62.0	1	24.0	17	47	35.0	9.7	22.	7	2.0	8
Delaware	Swarthmore—Swarthmore College	190	30.077	30.633	29.470	44.3	66.4	1	22.0	17	52.	36.0	16.	26.	2	7.0	11
Erie.*	Erie	681	30.060	30.650	29.370	42.5	68.0	2	25.0	17	48.	36.9	11.2	23	12	4.0	1
Fayette	Uniontown	1,000	30 037	30.511	29 572	44.1	68 0	1, 2	20.0	30	50.	37.0	13.2	30.	24	5.0	29
Forest	Tionesta	1,057				39.7	68.0	2	18.0	16	48.	34.1	14.3	34.	7	3.0	21
Franklin.*	Chambersburg—Wilson Female College	618	30.163	30.659	29.556	41.1	68.0	1	20.0	17	48.	33.7	4.8	32.	7	7.0	13
Fulton	McConnellsburg	875				41.4	66.0	1	22.0	20	49.	34.8	5.1	36.	7	5.0	20
Huntingdon.*	Huntingdon—The Normal College	650				40.6	65.0	1	17.0	17	49.	33.5	16.	36.	7	5.0	13
Indiana	Indiana—State Normal School	1,350				40.8	66.0	1	14.5	30	46	32.	4.	30.	24	2.6	20
Lancaster	Lancaster	413	30.084	30.629	29.484	43.2	65.0	2, 3	20.0	30	51.	36.0	15.0	24.	4	3.5	11

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE.											
							MAXIMUM.		MINIMUM.		DAILY RANGE.						
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean	Greatest.	Date.	Least.	Date.
Lawrence	New Castle	932				42.4	68.0	2	18.0	26	48.9	32.7	16.	33	12	6.0	22
Lebanon	Myerstown	474	30.033	30.587	29.452	41.5	57.7	2	27.8	29	50.0	34.5	15.	31 5	7	7.3	13
Lehigh	Centre Valley	348				46.1	71.0	7	27.0	30	55.0	39.	15.	37	7	3.0	20
Luzerne	Drifton—																
	Drifton Hospital	1,655				40.1	60.0	2	17.0	17	47.3	34.0	13.	25.	17	5.0	22
Lycoming,*	Nisbet	550				41.4											
Mercer,*	Greenville—																
	Thiel College	1,000	30.000	30.608	29.361	41.5	66.5	2	16.3	30	48.9	34.1	14.	28.2	24	6.6	13
Mifflin	Lewistown (16 days)	500				39.1	52.0	19	20.5	17	45.2	33.2	12.	27.5	17	6.0	29
Montgomery	Pottstown	150				46.0	64.3	1	22.0	17	53.0	38.0	15.	27		5.0	5
Northampton	Bethlehem	360				45.0	66.0	3	21.0	17	51.0	38.0	13.	22	15	5.0	8
Perry	New Bloomfield	400				41.0	64.0	3	19.0	17	49.0	35.0	14.	34	7	4.0	
Philadelphia*	Philadelphia—																
	Signal Office	117	30.100	30.690	29.440	47.0	65.0	3	27.0	30	55.	40.8	12.	22	27	4.0	20
Potter	Coudersport	1,670				41.5	59.0	11	10 0	17	48.4	33.	10.	27 0		2.0	20
Schuylkill	Girardville	1,000	30.040	30.657	29.498	41 4	65.0	3	21.0	17	48.4	34.	13.	27 0		4.0	20
Snyder	Selinsgrove	445				43.0	65.0	3	25.0	7	50.3	32.	18.	33 0		8.0	29
Somerset	Somerset	2,250				40.4	70.0	4	10.0	30	49.3	31.	17.	39.0	4	4.0	20
Sullivan	Eagles Mere	2,060	30.106	30.521	29.594	37.3	60 0	2	16.0	30	41.9	31.	10.	21.0	18	3.0	13
Tioga	Wellsboro'	1,327	30.058	30.658	29.414	38.1	56.0	2	12.0	17	44.2	32.	10.	34.0	19	3.0	
Union,*	Lewisburg	450				40.3	61.0	2	17.0	17	48.4	32.3	16.	33.0		5.0	22
Warren	Columbus	1,410				39.1	63.0	12	12.0	17	44.9	33.2	11.	32	17	2.0	29
Washington	Canonsburg	950				39.8	69.0	1	19.0	19, 20	47.3	31.4	15.	32	7	5.0	13
Wayne	Honesdale	1,000				41.2	61.0	3	14.0	17	46.9	35.5	11.	28	17	4.0	13
Westmoreland	Greensburg	1,175				43.0	73.0	1	18.5	30	55.	34.6	20.			9.0	21
Wyoming,*	South Eaton	660				42.7	61.0	3	14.0	17	47.8	37	10.	29.0	17	3.0	13
York,*	York	385	30.085	30.686	29.519	43.1	68.0	3	23.5	17	53.1	36.	16.	32 5		6.0	13

*Observations taken at 8 A. M. and 8 P. M. †Observations taken at 12 noon.

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	Total snowfall during month.	Depth of snow on ground at end of month.	Number of days rainfall.	NUMBER OF DAYS Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Adams.*	Gettysburg.	. . .	. . .	6.47	. . .	. . .	16	5	6	19	W	W	W
Allegheny.*	Pittsburgh.	81.0	57.8	4.61	. . .	. . .	19	3	9	18	W	W	W
Bedford.	Charlesville.	87.5	36.8	5.03	. . .	. . .	11	5	8	17	NW	NW	NW
Berks.*	Reading.	83.5	41.2	8.88	. . .	. . .	14	8	8	14	NW	NW	NW
Blair.†	Altoona.	75.4	38.0	4.02	. . .	. . .	14	. . .	. . .	. . .	. . .	. . .	. . .
Bradford.	Wysox.	81.8	34.9	5.02	. . .	. . .	15	4	1	25	E	W	W
Bucks.	Quakertown.	82.1	37 1	8.88	. . .	. . .	17	4	10	16	W	W	W
Cambria.	Johnstown.	. . .	. . .	5.33	. . .	. . .	20	3	9	18	SE	SE	SE
Cameron.	Emporium.	. . .	. . .	5.11	. . .	. . .	15	4	4	22	W	W	W
Carbon.*	Mauch Chunk.	. . .	. . .	8.18	. . .	. . .	15	. . .	. . .	. . .	. . .	. . .	. . .
Centre.	State College— Agricultural Experiment Station.	85.0	35.0	6.48	. . .	. . .	18	2	8	20	W	W	W
Chester.	West Chester.	79.0	37.5	9.91	. . .	. . .	18	10	4	16	NW	NW	NW
Clarion.	Clarion— State Normal School.	76.4	36.0	3.73	. . .	. . .	. . .	4	5	21	SW	SW	SW
Clearfield.	Grampian Hills.	. . .	. . .	3.86	3.00	2.00	18	3	6	21	W	W	W
Clinton.	Lock Haven.	. . .	. . .	6.98	. . .	. . .	16	8	8	14	W	W	W
Columbia.	Catawissa.	. . .	. . .	6.95	. . .	. . .	15	. . .	. . .	. . .	. . .	. . .	. . .
Crawford.	Meadville— Allegheny College.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Cumberland.	Carlisle.	90.0	39.8	9.03	. . .	. . .	16	3	14	13	W	W	W
Dauphin.*	Harrisburg.	81.0	36.4	6.59	. . .	. . .	18	4	9	17	W	W	W
Delaware.	Swarthmore— Swarthmore College.	80.8	38.0	6.74	. . .	. . .	12	8	11	11	W	NW	NW
Erie.*	Erie.	82.0	36.0	3.29	. . .	. . .	20	4	6	20	SW	SW	SW
Fayette.	Uniontown.	84.7	40.0	8.90	. . .	. . .	17	8	10	12	NW	NW	W
Forest.	Tionesta.	. . .	. . .	4.20	. . .	. . .	7	. . .	. . .	. . .	. . .	. . .	. . .
Franklin.*	Chambersburg— Wilson Female College.	82.5	36.7	5.73	. . .	. . .	16	7	8	15	. . .	. . .	. . .
Fulton.	McConnellsburg.	83.6	37.5	6.51	. . .	. . .	14	4	13	13	W	W	W
Huntingdon.*	Huntingdon— The Normal College.	. . .	. . .	6.65	. . .	. . .	16	4	9	17	NE	. . .	NW
Indiana.	Indiana— State Normal School.	85.2	36.1	5.20	4.00	1.00	19	3	11	16	W	W	W

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	Total snowfall during month.	Depth of snow on ground at end of month.	Number of days rain fall.	NUMBER OF DAYS Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Lancaster	Lancaster	92.8	41.6	9.02			14	4	13	13	W	W	W
Lawrence	New Castle			2.89	1.00		9	2	7	21	E	E	E
Lebanon	Myerstown	94.3	38.6	9.99			15	3	3	21	NW	NW	NW
Lehigh	Centre Valley			7.88			14	4	11	15	NW	NW	NW
Luzerne	Drifton— Drifton Hospital			7.39			15				NW	NW	NW
Lycoming,*	Nisbet			7.70			12						
Mercer,*	Greenville— Thiel College	94.9	36.9	2.72	4.00		14	0	6	24	E		SE
Mifflin	Lewistown (16 days)	86.9	34.8	4.09			9	3	1	12	NW	NW	NW
Montgomery	Pottstown	81.0	40.5	9.15			13	5	13	12	NW	NW	NW
Northampton	Bethlehem	80.0	39.0	8.71			12	16	2	12	W	W	W
Perry	New Bloomfield			7.31			14	6	5	19	W	W	W
Philadelphia,*	Philadelphia— Signal Office	77.0	39.0	6.76			15	7	7	16	NW	NW	NW
Potter	Coudersport	86.1	36.4	3.80	2.00		10	4	3	23	W	W	W
Schuylkill	Girardville			10.16			17	2	13	15	W	W	W
Snyder	Selinsgrove	82.8	37.0	9.13			15	1	10	19	SW	SW	SW
Somerset	Somerset	99.0	36.0	7.22			16	2	9	19	SW	SW	SW
Sullivan	Eagles Mere	83.5	33.3	9.27	4.00		14	3	9	18	SW	SW	SW
Tioga	Wellsboro'	82.2	33.0	9.07			18	2	4	24	S	SW	S
Union,*	Lewisburg			7.13			14	2	11	17	W	W	W
Warren	Columbus			4.00	3.00	2.00	16	5	5	20	SW	SW	SW
Washington	Canonsburg	79.8	35.1	4.91	.75		18	5	9	16	W	W	W
Wayne	Honesdale	73.2	36.5	5.31	.25		15						
Westmoreland	Greensburg	77.7	27.0	8.30	2.50	.50	11	5	3	22	W	W	W
Wyoming,*	South Eaton			5.52			14	6	5	19	NW	NW	NW
York,*	York	81.4	37.4	8.28			17	6	10	14	NW	NW	NW

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon

PRECIPITATION FOR NOVEMBER, 1889.

	Erie.	New Castle.	Greenville.	Columbus.	Pittsburgh.	Uniontown.	Clarion.	Indiana.	Johnstown.	Somerset.	Grampian Hills.	Kemporium.	Blue Knob.	Phillipsburg.	Petersburg.	Huntingdon.	Hollidaysburg.	Altoona.	Chambersburg.	State College.	York.	Lock Haven.	New Bloomfield.	Wellsboro'.
1	.02	.21	.35	.43	.08	.31		.03	.15	.42	.06	.06	.60	.06	.60	.60	1.06	.03	.04	.30	.15	.05	.30	.10
2	.30			.11	.45	.88		.73	.55	.71		.08	.60	.72	1.39	.70	.21		.05	.80	.80	.85	.52	1.40
3																								
4																								
5																								
6																								
7																								
8	.12	.42	.33	.18	.02	1.08		.75	.92	.70	.56	.10	.70	.48	.61	.70	.72	.80	.50	.49	.60	.35	.16	.10
9	.01	.07			.21	.93		.51	.63	1.00	.47	.04	.60	.60	.78	.80	.56	.67	.05	.50	1.05	.60	.60	.05
10																								
11																								
12																								
13	.01	.40	.09	.06	.01	.26		.10	.07	.17	.17	.18	.10	.08	.06	.10	.07	.40	.13	.53	.40	.10	.16	.16
14	.02		.05	.12	.03	.95		.00	.08	.80	.53	.74	.90	.01	.63	.05	.01	.19	.05	.04	.05	.55	.01	.34
15	.16													.25		.10	.04	.28	.13		1.55		.90	
16														.32		.05								
17																								
18	.04	.71	.08	1.30	.74	.51		.45	.97	.50	.42	.08	.10	.77	.38	1.10	.38	.69	1.33	.08	.01	.40	.10	.01
19	.01	.34	.12	.38	.44	.61		.03	.31	.60	.70	1.01	.60	.46	.32	1.15	.53	.12	.79	.20	.06	2.01	1.00	.15
20	.04	.14	.10	.04	.05	.21		.04	.11	.25	.17	.07	.60	.10	.05	.50	.25	.13	.18	.24	.12	.16	.20	.40
21	.04		.07	.40	.01	.13		.22	.11	.15	.12	.04	.55	.55	.05	.18	.16	.14	.40	.15	.38	.05	.04	.04
22	.05		.17	.31	.16	.30		.30	.11	.05	.07	.13	.55	.04	.24	.05	.16	.06		.05	.06	.45	.04	
23	.01		.02	.05	.01	.04		.14	.11	.55	.04	.07	.30	.15	.33	.21	.34	.02	.32	.14	.01	.01		
24	.01				.24	.73		.21	.29	.16	.16	.05		.01			.05				.35	.16		
25	.16		.50	.43	.30	.45		.10	.22	.90	.10	.22	.60	.04	.80	.80	.34	.02	.05	.64	.66	.61	.80	.54
26	.14	.25	.11	.12	.10			.19	.08	.05	.04	.22	.30	.01	.10	.10	.05	.05		.11	.33	.35	.28	.68
27	.02	.32	.20	.03	.03	1.50		.14	.04	.15	.04	.01	.35	.01		.03	.03							
28				.02		.04		.30			.04		.04	.01										
29																								
30																								
31																								
	3.29	2.89	2.72	4.00	4.61	8.90	3.73	5.20		7.22	3.86	5.11	8.47	5.22	7.25	6.65	6.00	4.02	5.73	6.48	8.28	6.96	7.31	9.07

PRECIPITATION FOR NOVEMBER, 1889—*Continued.*

	Harrisburg.	Selinsgrove.	Lancaster.	Le Roy.	Eagles Mere.	Myerstown.	Wysox.	Catawissa.	Girardville.	Wilkes-Barre.	South Eaton.	Drifton.	Reading.	Pottstown.	West Chester.	Contesville.	Kennett Square.	Dyberry.	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Selsholtzville.	Frederick.
1.	.02														.03	.01								
2.	.04	21	.05	.04	.95	20	.26	.40	.84			.60	.34	.05	.08	.03	.05	.22	1.00	.11	.01	.10		
3.	.02	60	.48	.38	.44	.61	.09	.90	1.27	1.29	1.12	1.04	.57	.60	.68	.59	.67	1.59	.46	.81	.44	.37	1.21	.64
4.																								
5.																								
6.																								
7.							.04																	
8.	.30	.30	.39	.10	1.03	.47	.25	.55	.56	.11	.12	.82	.37	.40	.47	.46	.40	.11	.22	.34		.21		
9.	1.16	1.09	1.58	.20	.82	1.97		.90	1.11	.61	.36	.40	1.96	2.30	1.38	1.66	1.74	.58	.58	2.59	1.35	1.26	2.63	2.63
10.		.15		.04		.09			.09			.06	.05		.08		.16			.04	.21	.04	.01	
11.	.20	.10	.17	.17	.36	.22	.19	.09	.13	.11	.08	.10	.15	.10	.16	.08		.20	.09	.13	.02	.02	.21	.09
12.					.09										.04					.02				
13.	.86	.51	1.01	.35	.23	.63	.32	.52	1.23	.51	.26	.82	.95	1.20	1.01	1.14	1.05	.44	.45	1.01	.82	.73	.99	1.00
14.	.02			.11			.07			.07	.17				.06			.07		.01				
15.				.05					.05															
16.																								
17.	.04		.12			.04	.09	.10	.08				.04			.01								
18.	.56	.60	.96	.45	1.03	1.09	1.12	.35	1.10	.26		.62	.68	.65	.97	.81	.50		.05	.36	.26	.95		
19.	1.26	3.56	2.33	2.38	1.64	2.26	.89	1.10	1.14	1.10	1.20	.84	2.30	1.50	2.62	1.60	2.31	.46	.50	.96	1.62	.97	2.11	1.24
20.	.10	.25	.10	.01	.86	.05	.10	.34	.16	.03	.12	.07	.09	.10	.08	.15	.12	.08	.07	.16		.02	.12	.10
21.	.20	.65	.26	.06	.58	.27	.41	.30	.36	.03	.24		.42	.40	.40	.33	.35	.34	.30	.37	.02	.27	.33	.36
22.	.06	.02		.42			.14	.02	.03	.38	.11				.08	.03		.16	.05		.36	.03		
23.	.01			.05						.40	.01													
24.				.01															.04					
25.	.20	.22	.52		.08	.41		.17	.28	.09	.08	.46	.72	.65	.37	.38	.20	.05	.02	.61		.11	.61	.60
26.												.74												
27.	.60	.56	.37	.20	.47	1.22	.97	.85	1.36	.25	.54	.77	.24	.60	.75	.59	.62	.35	1.10	.77	1.00	.60		
28.	.34	.40	.68	.74	.69	.46	.08	.35	.37	1.15	1.11	.03		.60	.45	.73	.75	1.05	.37	.58	.63	1.08	1.48	.97
29.																			.01					
30.				.04								.02								.01				
31.																								
	6.59	9.13	9.02	5.80	9.27	9.91	5.02	6.95	10.16	6.39	5.52	7.39	8.88	9.15	9.91	8.60	8.92	5.70	5.31	8.88	6.74	6.76	9.70	7.63

Precipitation for November, 1889—*Continued.*

	Ottsville.	Smith's Corner.	Doylestown.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.	Bethlehem.	Canonsburg.	Carlisle.	Centre Valley.	McConnellsburg.	Westtown.	Lewisburg.	Mauch Chunk.	Nisbet.	Charlesville.	Lynnport.	Tionesta.	Gettysburg.	Lewistown.	Greensburg.	Tipton.	Coudersport.
1.										.03				.10	.01									.10
2.									.10	.04	.13				.35					.05		.03		
3.	.82	.99	63	.98	.55	.59	.97	1.07		.70	1.03	.50	.55	1.17	1.48	.90				.57				.80
4.	.27																							
5.																								
6.																	.43							
7.																								
8.								1.44	1.03	.26	.25	.62		.50	.16		1.18			.53		1.48		.20
9.	2.10	2 78	2.15	2.10	1.98	1.56	2.40	1.25	15	.90	2.36	.83	1.95	.02	1.01	.80				1.05		1.48		
10.	.71						.15		.05		.08				.01									
11.	.15	.08	.90	.40	.05	.05	.01	.12	.03	.13	.07	15	05	.01	.16	.10	.16			.11				
12.																				.01				
13.	.89	1.00	.95	.60	.93	.87	1.05	.95	.81	.99	.84	1.27	.90	.24	1.00	.40	.87			1.10		1.82		
14.										.12				.24								.02		.80
15.									.03															
16.																								
17.									1.13			.26					.38			.11	.07	1.40		
18.	.51				.02			.78	.16	1.00	.31	.73		.60	.09	.80	.58			.80	.76	.06		
19.	.50	1.19	1.68	1.03	1.17	2.12	.96	.42	.38	1.68	.58	.43	2.90	2.46	1.14	2.90	.51			.46	1.56	.65		.20
20.	.09	.08	.80	.73	.06		.07	.08	.15	.16	.09	.29			22	.20	.10			.28	.09			
21.	.37	.33	.38	.26	.41	.43	.33	.31	.02	.22	.26	.34		.10	.20	.40	.14			.40	.28			
22.					.01	.06			.25	.20		.11	.37	.50		.20				.05	.05	1.20		
23.									.02															.70
24.	.40							.66																.70
25.	.17		.56	.65	.40	.22	.53		.15	1.60	.57	.30	.26	.15	.16	.20	.07			.20	.19	.09		
26.									.12															
27.									.30	.46	1.15	.58	1.15	.54	.59	.30	.61			.53	.74	.07		.10
28.	1.89	2.61	2.00	1.35	1.85	1.88	2.16	1.63		.45	.16	.10			1.60	.50				.22	.35			.10
29.									.03					.50										
30.																								.10
31.																								
	8.87	9.06	10.05	8.11	7.43	7.78	8.63	8.71	4.91	9.03	7.88	6.51	8.13	7.13	8.18	7.70	5.03	8.50	4.20	6.47	4.09	8.30	6.12	3.80

DECEMBER, 1889.

TEMPERATURE.

The mean temperature for December, 1889, determined from sixty-four stations gives a mean or average temperature of 39°.3, which is about 9° in excess of the normal, and as compared with Philadelphia temperatures for the past 100 years and over, it was the warmest December on record.

The greatest departures were in the western part of the state where the mean temperature for the month averaged 11° above the normal. In the eastern portion it was about 7° above.

There was a complete absence of the low temperatures that usually occur in December, and the maximum temperatures were decidedly higher.

The highest temperatures reported were Centre Valley, 73; Lewistown, 70; Erie, 70; Waynesburg, 70, and Coatesville, 68°.5.

The lowest were Le Roy, zero; Eagles Mere, zero; Somerset, 6°; Wysox, Grampian Hills, Wellsboro', Columbus, Dyberry and Honesdale each 8°. The lowest temperatures occurred on the 4th, and the highest during the 25th.

Total excess in temperature during December at Philadelphia, 279°.

Total excess in temperature during December at Pittsburgh, 387°.

Total excess in temperature since January 1 at Philadelphia, 613°.

Total excess in temperature since January 1 at Pittsburgh, 568°.

BAROMETER.

The mean pressure for the month, 30.15, is about .05 higher than the above. The highest occurred on the 31st, and the lowest on the 26th.

PRECIPITATION.

The total precipitation for the month, 2.77 inches, is about two-tenths less than the average. There was a slight excess in the western part of the state and a deficiency in the eastern. The greatest totals were Columbus, 5.05; Grampion Hills, 4.67; Johnstown, 4.62; Tipton, 4.49, and Somerset, 4.29 inches. The least were Philadelphia, 0.85; Germantown, 0.91, and Swarthmore, 1.05 inches.

The only snow that occurred was in the northeastern part of the state. The following are the greatest totals. Dyberry, 7 inches; Honesdale, 6 inches; South Eaton, 6 inches; Eagles Mere, 5 inches; Wellsboro', 5 inches and Catawissa, 4 inches. Rains were of frequent occurrence but light.

WIND AND WEATHER.

The prevailing wind was from the west. No severe gales passed over the state.

The month will be memorable from having been the warmest December on record.

Average number.—Rainy days, 12; clear days, 11; fair days, 9; cloudy days, 11.

Monthly Summary of Reports *by Voluntary Observers of the Pennsylvania State Weather Service for December, 1889.*

County.	Station.	Elevation above sea level (feet).	Barometer reduced to sea level.			Temperature.											
							Maximum.		Minimum.				Daily range.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Adams,*	Gettysburg,	624	. . .	. . .	. . .	39.6	69.0	25	15.0	4	49.4	29.8	19.6	36.0	2	4.0	18
Allegheny,*	Pittsburgh,	847	30.148	30.665	29.588	45.6	67.0	29	22.0	1	53.5	37.8	15.7	26.0	29	7.0	30
Bedford,	Charlesville (26 days),	1,300	. . .	. . .	. . .	39.7	66.0	29	12.0	1	50.0	29.4	20.6	40.0	7	5.0	18
Berks,*	Reading,	304	30.180	30.707	29.850	39.4	67.0	25	15.0	5	48.6	30.4	18.2	29.0	24	5.0	18
Blair,†	Altoona,	1,181	. . .	. . .	. . .	44.1	65.0	21	21.0	2	54.7	35.6	17.1	29.0	23	5.0	18
Bradford,	Wysox,	718	30.155	30.796	29.558	35.7	62.5	20	8.0	4	44.7	25.7	19.0	33.0	20	5.0	17
Bucks,	Quakertown,	536	30.160	30.870	29.430	37.9	67.0	25	11.0	4	48.8	28.3	20.5	30.5	24	5.7	18
Cambria,	Johnstown,	1,184	30.182	30.780	29.630	42.6	67.0	20, 25	10.0	1	54.1	33.4	20.7	36.0	7	9.0	15
Cameron,	Emporium,	1,080	. . .	. . .	. . .	38.6	62.0	20	12.0	4	46.6	27.5	19.1	31.0	7	5.0	17
Carbon,*	Mauch Chunk,	550	. . .	. . .	. . .	37.6	60.0	9	14.5	4	47.4	27.8	19.6	32.5	2	6.0	18
Centre,	State College—Agricultural Experiment Station,	1,191	30.121	30.750	29.402	38.9	64.0	20, 26	9.0	4	47.4	30.3	17.1	32.0	30	3.0	17
Chester,	West Chester,	455	30.156	30.880	29.444	41.0	67.0	25	16.0	4	50.1	32.9	17.2	25.0	25	5.0	18
Clarion,	Clarion—State Normal School,	1,530	. . .	. . .	. . .	39.8	63.0	29	10.0	4	48.2	28.8	19.4	32.0	27	6.0	15
Clearfield,	Grampian Hills,	1,450	. . .	. . .	. . .	36.8	60.0	20, 29	8.0	1	45.0	30.0	15.0	28.0	24	2.0	17
Clinton,	Lock Haven,	560	. . .	. . .	. . .	37.9	66.0	25	14.0	4	46.6	28.6	18.0	30.0	13	5.0	16
Columbia,	Catawissa,	491	. . .	. . .	. . .	38.8	62.2	25	17.0	4	45.6	32.0	13.6	23.0	20	5.0	14
Cumberland,	Carlisle,	480	. . .	. . .	. . .	39.6	69.5	25	15.5	4	49.6	30.3	19.3	37.0	2	5.0	18
Dauphin,*	Harrisburg,	361	30.200	30.850	29.600	40.0	66.0	25	14.0	4	47.7	32.5	15.2	26.0	2	5.0	18
Delaware,	Swarthmore—Swarthmore College,	190	30.163	30.803	29.543	41.4	67.0	26	18.0	4	50.2	31.9	18.3	28.5	25	4.2	18
Erie,*	Erie,	681	30.100	30.707	29.501	41.0	70.0	29	12.0	4	48.9	32.5	16.4	34.0	29	6.0	30
Fayette,	Uniontown,	1,000	30.212	30.522	29.701	46.0	67.0	20	14.0	1	52.9	37.3	15.6	32.0	24	4.0	22
Forest,	Tionesta,	1,057	. . .	. . .	. . .	38.5	66.0	27	11.0	4	50.0	31.4	18.6	38.0	27	4.0	17
Franklin,	Chambersburg—Wilson Female College (29 days),	618	30.211	30.831	29.633	37.9	64.0	26, 27	15.0	1, 4	50.2	28.3	21.1	37.0	2	7.0	18
Fulton,	McConnellsburg,	875	. . .	. . .	. . .	41.1	67.0	25	15.0	1	52.8	31.0	21.8	40.0	2	6.0	18
Greene,	Waynesburg,	750	. . .	. . .	. . .	42.8	70.0	25	. . .	. . .	55.6	30.0	25.6	. . .	. . .	. . .	. . .
Huntingdon,*	Huntingdon—The Normal College,	650	. . .	. . .	. . .	39.9	68.0	20, 21	12.0	4	52.1	27.7	24.4	46.0	26	10.0	18
Indiana,	Indiana—State Normal School,	1,350	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Lancaster,	Lancaster,	413	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Lawrence,	New Castle,	932	. . .	. . .	. . .	42.8	66.0	29	12.0	1	50.0	29.5	20.5	36.0	30	10.0	9
Lebanon,	Myerstown,	474	30.113	30.731	29.608	37.7	67.5	25	16.5	5	48.6	29.3	19.3	29.2	13	3.3	18

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Elevation above sea level (feet).	BAROMETER REDUCED TO SEA LEVEL.			TEMPERATURE.											
							MAXIMUM.		MINIMUM.				DAILY RANGE.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Lehigh,	Centre Valley,	348	. . .	. . .	. . .	40.7	73.0	25	19.0	4	52.6	33.1	19.5	34.0	24	5.0	15
Luzerne,	Drifton—																
	Drifton Hospital,	1,655	. . .	. . .	. . .	36.3	61.0	24	10.0	4	45.8	28.8	17.0	31.0	24	5.0	6
Lycoming,*	Nisbet,	559	. . .	. . .	. . .	36.5	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Mercer,*	Greenville—																
	Thiel College,	1,000	30.091	30.644	29.495	39.5	64.7	29	11.4	1	49.9	29.2	20.7	30.0	27	5.1	23
Mifflin,	Lewistown,	500	. . .	. . .	. . .	41.0	70.0	25	14.5	4	50.5	30.2	20.3	38.0	2	5.0	17
Montgomery,	Pottstown,	150	. . .	. . .	. . .	42.0	69.0	25	18.0	4	51.0	33.0	18.0	31.0	24	4.0	18
Northampton,	Bethlehem,	380	30.127	30.813	29.508	40.0	68.0	25	12.0	4	48.0	31.0	17.0	29.0	26	5.0	18
Perry,	New Bloomfield,	400	. . .	. . .	. . .	39.0	68.0	25	13.0	4	49.4	29.0	20.4	35.0	2	4.0	18
Philadelphia,*	Philadelphia—																
	Signal Office,	117	30.193	30.881	29.604	43.6	68.0	26	16.0	4	51.0	36.1	14.9	24.0	25	5.0	14
Potter,	Coudersport,	1,670	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Schuylkill,	Girardville,	1,000	30.170	30.788	29.620	38.3	64.0	25	16.0	4	47.4	28.6	18.8	33.0	21	6.0	18
Snyder,	Selinsgrove,	445	. . .	. . .	. . .	38.8	69.0	25	21.0	31	49.4	31.9	17.5	37.0	25	0	4
Somerset,	Somerset,	2,250	. . .	. . .	. . .	41.7	63.0	29	6.0	1	51.2	31.4	19.8	34.0	1	2.0	15
Sullivan,	Eagles Mere,	2,060	30.252	30.849	29.698	33.1	51.0	19, 20	0	4	38.8	26.2	12.6	30.0	4	2.0	23
Tioga,	Wellsboro',	1,327	30.126	30.472	29.616	34.5	64.0	25	8.0	4	42.7	28.4	14.3	25.0	1	8.0	29
Union,*	Lewisburg,	450	. . .	. . .	. . .	37.8	64.0	25	14.0	4	46.5	29.2	17.3	30.0	13	5.0	17
Warren,	Columbus,	1,410	. . .	. . .	. . .	37.3	60.0	29	8.0	4	44.8	29.8	15.0	30.0	29	2.0	30
Washington,	Canonsburg,	950	30.149	30.658	29.713	43.4	68.0	17	11.0	1	52.7	31.6	21.1	34.0	24	9.0	15
Wayne,	Honesdale,	1,000	. . .	. . .	. . .	35.5	61.0	25	8.0	4	42.6	28.4	14.2	28.0	20	4.0	18
Westmoreland,	Greensburg,	1,175	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Wyoming,*	South Eaton,	660	. . .	. . .	. . .	34.5	67.0	25	12.0	4	46.0	27.6	18.4	29.0	20	4.0	17
York,*	York,	385	30.189	30.874	29.536	40.6	68.0	25	16.5	4, 5	52.3	31.9	20.4	34.5	27	5.0	15

* Observations taken at 8 A. M. and 8 P. M. † Observations taken at 12 noon.

Monthly Summary of Reports—*Continued.*

County	Station.	Relative humidity.	Dew point.	Precipitation.				Number of Days			Wind.		
				Total inches.	Total snowfall during month.	Depth of snow on ground at end of month.	Number of days rainfall.	Clear.	Fair.	Cloudy.	Prevailing direction.		
											7 A. M.	2 P. M.	9 P. M.
Adams.*	Gettysburg,	...	...	2.01	...	...	11	13	2	16	S	S	S
Allegheny.*	Pittsburgh,	75.2	31.4	3.07	...	...	16	6	14	11	NW	NW	NW
Bedford.	Charlesville (26 days),	78.3	33.7	1.68	...	...	6	11	12	8	W	W	W
Berks.*	Reading,	92.8	36.1	2.35	...	...	9	13	12	6	NW	NW	NW
Blair.†	Altoona,	68.7	34.0	3.42	...	...	14	...	...	...	...	...	...
Bradford.	Wysox,	78.9	29.8	2.51	3.50	...	13	10	4	17	W	W	W
Bucks.	Quakertown,	77.3	32.0	2.43	1.00	...	13	12	9	10	W	NW	NW
Cambria.	Johnstown,	74.9	35.0	4.62	...	...	17	8	14	9	SE	SW	SE
Cameron.	Emporium,	...	...	3.85	...	...	13	14	3	14	W	W	W
Carbon.*	Mauch Chunk,	...	...	3.58	3.00	...	11	13	11	7	...	...	...
Centre.	State College— Agricultural Experiment Station,	78.0	32.1	3.29	...	...	14	9	10	12	W	W	W
Chester.	West Chester,	...	...	1.95	...	...	13	14	8	9	NW	NW	NW
Clarion.	Clarion— State Normal School,	76.7	33.5	3.61	...	...	13	7	14	10	SW	SW	SW
Clearfield.	Grampian Hills,	...	...	4.67	...	...	14	9	11	11	W	W	W
Clinton.	Lock Haven,	...	...	4.19	...	...	16	12	8	11	W	W	W
Columbia.	Catawissa,	...	...	2.41	4.00	...	13	...	...	...	...	...	...
Cumberland.	Carlisle,	84.5	34.5	2.44	...	...	14	13	6	12	W	W	W
Dauphin.*	Harrisburg,	76.9	32.3	2.11	...	...	14	13	5	13	E	E	E
Delaware.	Swarthmore— Swarthmore College,	77.8	34.5	1.05	...	...	6	8	10	13	SW	SW	SW
Erie.*	Erie,	80.0	33.0	4.08	...	...	17	7	10	14	SW	SW	SW
Fayette.	Uniontown,	81.0	40.0	2.76	...	...	10	13	11	7	SW	SW	SW
Forest.	Tionesta,	...	...	...	...	...	...	...	...	...	...	...	...
Franklin.*	Chambersburg— Wilson Female College (29 days),	84.6	33.2	2.03	...	...	7	...	...	...	...	...	...
Fulton.	McConnellsburg,	74.7	33.4	2.44	...	...	8	15	7	9	W	W	W
Greene.	Waynesburg,	...	...	...	...	...	...	...	...	...	...	...	...
Huntingdon.*	Huntingdon— The Normal College,	...	...	3.14	...	...	12	10	10	11	W	...	NW
Indiana.	Indiana— State Normal School,	...	...	...	...	...	...	...	...	...	...	...	...

MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total inches.	Total snowfall during month.	Depth of snow on ground at end of month	Number of days rain-fall.	NUMBER OF DAYS Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 A. M.	2 P. M.	9 P. M.
Lancaster,	Lancaster,												
Lawrence,	New Castle,			3.64			12	8	10	13	W	W	W
Lebanon,	Myerstown,	86.7	33.7	2.20			10	9	8	14	W	W	W
Lehigh,	Centre Valley,			2.30			10	9	11	11	SW	NW	SW
Luzerne,	Drifton—												
	Drifton Hospital			2.11	3.50		9				NW	NW	NW
Lycoming,*	Nisbet,			4.00			9						
Mercer,*	Greenville—												
	Thiel College,	89.2	33.8	3.03			10	6	8	17	SW	SW	SW
Mifflin,	Lewistown,	77.1	33.3	2.35			14	11	10	10	NW	NW	NW
Montgomery,	Pottstown,	79.0	32.0	2.03			7	15	8	8	NW	NW	NW
Northampton,	Bethlehem,	78.0	36.0	1.66			8	18	2	11	NW	W	NW
Perry,	New Bloomfield,			2.24			9	16	8	7	W	W	W
Philadelphia,*	Philadelphia—												
	Signal Office,	71	32.7	.85			10	11	9	11	SW	SW	SW
Potter,	Coudersport,												
Schuylkill,	Girardville,			3.31	1.75		13	9	15	9	W	W	NW
Snyder,	Selinsgrove,	79.6	32.5	2.66			11	15	7	9	SW	SW	SW
Somerset,	Somerset,	81.2	36.0	4.29			13	5	17	9	SW	SW	SW
Sullivan,	Eagles Mere,	76.7	26.8	3.28	5.25		9	10	14	7	SW	SW	SW
Tioga,	Wellsboro',	82.4	29.5	3.93	5.00		15	3	13	15	S	S	S
Union,*	Lewisburg,			2.67	1.20		11	7	12	12	SW	SW	SW
Warren,	Columbus,			5.09			14	8	7	16	SW	SW	SW
Washington,	Canonsburg,	77	36.	3.30			16	12		12	W	SW	W
Wayne,	Honesdale,	71	31.	3.53	6.00		13						
Westmoreland,	Greensburg,												
Wyoming,†	South Eaton,			2.32	5.50		11	10	9	12	NW	NW	NW
York,*	York,	79.0	32.0	1.09			10	15	4	12	SW	SW	SW

*Observations taken at 8 A. M. and 8 P. M. †Observations taken at 12 noon.

PRECIPITATION FOR DECEMBER, 1889.

	Erie.	New Castle.	Greenville.	Columbus.	Pittsburgh.	Uniontown.	Clarion.	Indiana.	Johnstown.	Somerset.	Grampian Hills.	Emporium.	Blue Knob.	Phillipsburg.	Petersburg.	Huntingdon.	Hollidaysburg.	Altoona.	Chambersburg.	State College.	York.	Lock Haven.	New Bloomfield.	Wellsboro'.	Harrisburg.
1.																									
2.	.30	.05	.19	.25	.07	.20			.12		.10	.20			.06		.06	.04		.02	.03		.01	.22	
3.														.20											
4.	.18	.22	.29	.16	.05		.17		03		.08	.09			.02		.05					04		.03	.01
5.					.01					.10				.10						.04					.01
6.																									
7.	.36	.05		.45	.13	.41	.34		31	.80	.43	.50		.35	.45	.26	.24	08	.42	.23	35	55	.46	.40	.42
8.	.06			.33	.22		.25		02	.25	.25	.22		.11		.10		40		.06		.20	.04	.16	.02
9.	.18		.02	.49	.27	.37	.19		34		16	.06		.07	.27	.20	.27		.18	.16	02	.15	.12	.18	.06
10.	.49	1.20	.19	.50	.36	.44	.39		48	.20	.48	.57		.40	.29	.35	.02	.43	.04	.24	07	.30	.22	.38	.17
11.										.41				.02				.20							
12.										.10									.07			.40			
13.						.18			.04																
14.	.54	.75	.40	.49	.62	.22	.86		1.30	1.02	1.08	.40		1.25	.42	1.40	1.47	1.10	.84	1.32		.40	.90	.30	.46
15.	02									.10				.10				.87							
16.	.06	.44	.12		16	.03			.10	.40							.08			.05		.02		.05	
17.	.50		.40	.55	.71		.33		.90	.20	.43	.52		.35	.41	.40	.48	.37	.45	.36	.36	.28	.26	1.64	.22
18.	.02	.18	.30	.01	03	.10			15		10	.13		.02	.09	.02	13	.07		.14	.03	10	.13	.10	.11
19.														.03			01	.04			.02				.04
20.	.38	.20	.06	.39	15		.33		12	.20	.20	20			.09	.06	10			.16	.03	15	.10	.08	.06
21.									02					.10			01	.09							
22.	.17	.10		.47	13		.15		13		.28	13		.10	07	.11	.07	.14		.08	.02	26		.10	.06
23.										.06															
24.	.14	.22	.46	.18			.10				.10													.08	
25.	.42	.23		.55	01	.56	.10		16			15		.30	.02					.09		.08			.04
26.					14	.25	.40		30		.38	.09			.12	.31	.34	.25	.03	.34	.16	.34		.24	.46
27.										.45				.10											
28.																									
29.	.30			.27	01				.04							.02	.03					.01			
30.	.01													.08		.01		.02				.01			
31.																									
	4.03	3.64	3.03	5.09	3.07	2.70	3.61		4.62	4.29	4.67	3.85		3.68	2.31	3.14	3.36	3.42	2.03	3.29	1.09	4.19	2.24	3.93	2.11

PRECIPITATION FOR DECEMBER, 1889—*Continued.*

	Selinsgrove.	Lancaster.	Le Roy.	Eagles Mere.	Myerstown.	Wysox.	Catawissa.	Girardville.	Wilkes-Barre.	South Eaton.	Drifton.	Reading.	Pottstown.	West Chester.	Coatesville.	Kennett Square.	Dyberrry.	Honesdale.	Quakertown.	Swarthmore.	Philadelphia.	Selsholtzville.	Frederick.	Ottsville.
1.																								
2.						.03																		
3.			.14	.21		.10			.07	.11	.08			.13	.02	.01	.12	.12			.04		.03	
4.														.04	.02				.06		.01			
5.			.01		.01		.17	.03	.03	.02					.01		.14	.13						
6.												.07											.02	
7.																								
8.	.35		.16	.81	.38	.35	.20	.48	.20	.25	.35		.25	.25	.18	.10	.47	.48	.47	.19	.03	.43	.28	.56
9.	.11		.13		.05				.08	.13		.15	.18	.11	.05		.15	.10	.10		.08		.15	
10.			.02	.12	.01	.08	.16	.20	.36		.12	.01			.01			.50	.01					.12
11.	.21		.13	42	.21	.08	.12	.34	.03	.20	.32	.02	.11	.11	.08		.51	.12	.18	.07	.14	.20	.12	
12.																								
13.								.02																
14.	.70		.30	.35	.60	.75	.82	.71	.38	.41	.35	1.15	.77	.42	.35		.60	.76	.63	.20	.20			
15.														.03									.66	
16.	.05					.30	.04	.04																
17.	.50		.85	.81	.42	.45	.43	.60	.78	.74	.42	.23	.22	.28	.22	.21	.20	.49	.33	.13	.11		.22	.89
18.	.30		.06	.16	.06	.02	.05	.22	.07	.08	.11	.47	.22	.15	.23		.40	.41	.16	.09	.03	.53		.06
19.	.11		.02					.09		.02		.03		.04	.03				.02		.02		.08	.01
20.	.03		.12			.10	.08				.06			.03	.02				.02				.02	
21.						.01		.04																
22.	.11		.06	.22	.04		.06	.11	.14	.07						.02	.06	.08	.03				.02	
23.																								
24.						.05	.02											.04						
25.	.19					.19								.01	.02				.01					.33
26.			.45	.18	.43		.27	.43	.58	.29	.30	.22	.28	.35	.37	.15	.20	.25	.41	.37	.19		.28	
27.																						.37		
28.																								
29.																								
30.							.03										.06	.05						
31.																								
	2.66		2.45	3.28	2.20	2.51	2.41	3.31	2.72	2.32	2.11	2.35	2.03	1.95	1.60	.49	2.91	3.53	2.43	1.05	.85	1.53	1.80	1.97

PRECIPITATION FOR DECEMBER, 1889—*Continued.*

	Smith's Corner.	Boyleston.	Lansdale.	Forks of Neshaminy.	Germantown.	Point Pleasant.	Bethlehem.	Canonsburg.	Carlisle.	Centre Valley.	McConnellsburg.	Westtown.	Lewisburg.	Mauch Chunk.	Nisbet.	Charlesville.	Lynnport.	Tionesta.	Gettysburg.	Lewistown.	Greensburg.	Tipton.	Coudersport.	Coopersburg.
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.05	.00	.46	.04	.15	.02	.04	.05	.01	.00	.45	.03	.01	.51	.10	.03	.	.	.47	.02	.	.12	.	.04
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.02	.	.	.02	.	.	.04	.07	.02	.02	.	.	.01	.14	.10	.	.	.	.	.	.02	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8	.40	.39	.35	.30	.15	.43	.04	.01	.03	.34	.45	.16	.11	.51	.50	.46	.	.	.47	.16	.	.37	.	.30
9	.	.	.	.	.	.	.	.10	.05	.08	.04	.08	.	.14	.40	.01	.	.	.05	.01	.	.12	.	.08
10	.	.	.	.	.	.	.	.12	.06	.24	.32	.	.	.02	.	.07	.	.	.03	.10	.	.26	.	.01
11	.12	.01	.10	.11	.07	.	.14	.26	.04	.	.	.	.23	.38	.	.39	.	.	.08	.19	.	.34	.	.15
12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14	.04	.71	.43	.08	.27	.75	.02	.08	.06	.49	.25	.40	1.00	1.30	.70	.07	.	.	.47	1.02	.	1.56	.	.07
15	.	.	.	.	.	.	.	.	.	.	.	.	.15	.	.	.	.	.	.02	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
17	.87	.91	.10	.35	.20	.35	.33	.60	.15	.46	.47	.18	.35	.68	.60	.	.	.	.31	.29	.	.27	.	.33
18	.	.	.	.02	.	.	.22	.05	.13	.22	.06	.06	.40	.04	.20	.	.	.	.31	.07	.	.24	.	.17
19	.	.	.	.	.	.	.	.19	.06	.	.	.	.05	.03	.	.	.	.	.08	.01	.	.25	.	.06
20	.	.	.	.01	.	.	.02	.40	.06	.11	.08	.	.10	.01	.	.30	.	.	.05	.06	.	.16	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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26	.02	.38	.37	.32	.22	.23	.25	.28	.36	.35	.28	.32	.36	.51	1.10	.	.	.	.19	.37	.	.07	.	.32
27	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.03	.	.	.	.	.	.	.	.	.	.	.	.01	.	.	.	.
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31	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2.36	2.30	1.71	1.65	.91	1.09	1.66	3.30	2.44	2.30	2.44	1.33	2.67	3.58	4.00	1.63	.	.	2.01	2.35	.	4.49	.	2.22

PRECIPITATION FOR THE YEAR 1889.

	Erie.	New Castle.	Greenville.	Columbus.	Pittsburgh.	Uniontown.	Clarion	Indiana.	Johnstown	Somerset.	Grampian Hills.	Emporium.	Blue Knob.	Phillipsburg.	Petersburg.	Huntingdon.	Hollidaysburg.	Altoona.
January.	2.71	3 17	3.52	3.32	2.50	2.34	3.35	2 94	....	3.48	3.32	2.75	....	2.41	....	2.84	2.56	1.82
February.	1.57	3 33	1.18	1.58	1 58	2 43	....	2.43	....	3.12	1 96	1.61	....	1.67	....	0 97	1.91	1.24
March.	1.73	2.72	....	1.62	2.32	3.60	1.91	1 47	....	2 52	2.57	1.44	....	2.27	....	3.17	3.09	2.37
April.	3.64	6.06	2.50	3 24	3 62	4.47	2.09	4 50	....	4.54	4.61	3.66	....	6.09	....	4.42	4.07	3.44
May.	2.51	3.20	2.57	2.88	6.45	6 93	4.59	4 71	....	8.32	1.60	8.04	....	5.28	....	7 18	7.43	4.75
June.	6.02	6.50	3.51	5.12	4.93	7.36	....	3.30	....	3 87	3.71	4 63	....	5.84	....	5.60	2.71	4.73
July.	1.68	....	1.04	2.00	5.48	4 21	....	....	....	5.06	7.31	7 08	4 70	5 21	....	5.38	6.22	4.60
August.	2.28	2.28	1.83	2.37	1 88	3.96	....	....	3.95	3.35	4.00	3.23	2 40	2.40	3 12	1.80	1.37	1 52
September.	4.85	4 01	3 68	5 25	2 87	3 79	3.32	4 60	4.59	2 94	2.76	2.84	4 70	2.91	3.57	4.35	3.01	2.74
October.	3.57	1.88	2.74	3.44	2.06	3.31	2.17	3 52	3.55	2.61	3.21	3.70	4.30	3 54	3.34	3.67	2.90	2.38
November.	3 29	2.89	2.72	4 00	4.61	3.90	3 73	5 20	5.33	7.22	3.86	5.11	3.47	5.22	7.25	6.65	6.00	4.02
December.	4.03	3.64	3 03	5 09	3.07	2.76	3.61	....	4 62	4.29	4.67	3.85	....	3.68	2.31	3.14	3.36	3.42
Annual.	37.66	....	....	39.77	41.37	53 96	....	....	....	51.33	43.58	47.89	....	46.72	....	49.35	45.23	37.06

Precipitation for the Year 1889—*Continued.*

	Chambersburg.	State College.	York.	Lock Haven.	New Bloomfield.	Wellsboro'	Harrisburg.	Selinsgrove.	Lancaster	Le Roy	Eagles Mere	Myerstown.	Wysox.	Catawissa.	Girardville.	Wilkes-Barre.	South Eaton.	Drifton.
January,	. . .	1.97	. . . .	3.48	3.52	7.02	2.86	4 00	2.83	. . . .	4.92	4.21	2.70	3.22	3.80	. . . .	. . . .	3.74
February,	. . . .	. . . .	. . . .	1.74	1.24	2.98	1 48	1 52	2 16	. . . .	3.87	1.85	1.73	1.61	1.66	. . . .	. . . .	1 46
March,	. . . .	. . . .	. . . .	2.63	3 91	3.24	3.26	2.60	3.80	. . . .	1 85	3 45	1 73	2.99	2 77	. . . .	. . . .	2 61
April,	. . . .	3 65	3.91	3.97	3.88	8.15	3 96	3 02	6 54	. . . .	5 71	. . . .	3 78	4.42	7 23	. . . .	. . . .	. . . .
May,	. . . .	. . . .	5 65	. . . .	6 06	3.45	9 51	9 20	4 40	. . . .	9 21	5.47	4.76	. . . .	6 98	. . . .	. . . .	. . . .
June,	. . . .	5.87	5.13	. . . .	6 25	10.40	7.18	5 10	. . . .	. . . .	. . . .	8 66	4.86	. . . .	. . . .	8.01	. . . .	4.99
July,	. . . .	4.68	4.34	. . . .	6 08	3.06	8 66	4 29	. . . .	. . . .	6 30	. . . .	5.17	6 62	9.46	. . . .	. . . .	9.55
August,	. . . .	3 15	3.83	. . . .	2.75	0.83	2.58	6.00	. . . .	2.08	2.82	3.07	2.07	6.17	6 08	. . . .	. . . .	4.77
September,	4 13	3 67	6 87	4.73	5 02	2.71	4 53	5 16	6 38	3.13	9 35	3.45	3 21	4.47	6 50	5179	3 32	5.56
October,	3.24	3 36	3.03	. . . .	4.35	5.61	3 33	3 56	3 88	4.73	8.61	4 47	3 84	2.82	4.41	3.16	4.11	5.74
November,	5.73	6.48	8.28	6.96	7 31	9.07	6.59	9.13	9 02	5 80	9.27	9.99	5.02	6.96	10 10	6.39	3.52	7.39
December,	2.03	3.29	1.09	4.19	2.24	3 98	2.11	2.66	. . . .	2.45	3.28	2.20	2 51	2 41	3.31	2.73	2.32	2.11
Annual,	. . . .	. . . .	. . . .	. . . .	52.61	60.45	56.07	56 33	. . . .	. . . .	. . . .	. . . .	41.38	. . . .	70.27	. . . .	. . . .	. . . .

PRECIPITATION FOR THE YEAR 1889—*Continued.*

	Reading.	Pottstown.	West Chester.	Coatesville.	Kennett Square	Dyberry.	Honeoadale.	Quakertown.	Swarthmore	Philadelphia.	Bolsboltsville.	Frederick.	Olivet.	Smith's Corner	Doylestown.	Lansdale	Forks of Neshaminy	Germantown.
January	3.74	4.12	4.78	4.33			4.15	4.68	4.80	3.75	4.28	3.44	4.30	4.19	4.33	2.90	3.56	3.82
February	1.03	1.92	2.46	1.85			2.10	2.36	1.92	2.00	2.13	1.84	2.67	2.22	2.06	1.63	2.05	2.19
March	3.71	3.73	5.44	4.49			1.88	3.47	3.43	2.54	3.50	2.74	4.43	3.35	3.77	2.90	3.35	3.34
April	6.33	0.15	5.97	7.08		1.74	5.55	4.53	3.51	3.17	6.22	3.80	4.54	5.03	4.92	4.90	4.89	3.20
May	3.00	7.47	5.45	5.99		4.55	5.47	5.45	5.84	4.72	4.54	4.45	5.45	4.75	4.83	4.35	5.70	5.73
June	8.21	6.20	5.78	5.99	3.16	4.72	3.13	7.31	3.44	3.39	7.91	6.41	7.58	7.34	5.83	5.45	4.09	8.36
July	9.30	12.50	12.49	12.86		4.24	5.55	11.54	8.74	8.29	11.76	12.49	12.19	12.30	11.46	15.05	10.36	10.60
August	4.45	5.05	4.43	3.05		6.53	2.60	4.78	3.52	4.05	4.15	3.93	5.18	4.98	4.61	4.66	5.30	6.66
September	7.06	8.44	9.96	9.12	10.01	2.85	5.92	8.06	8.04	4.66	7.32	6.69	7.89	8.05	8.61	8.33	8.76	6.
October	5.74	4.56	4.97	4.01	5.04	4.18	4.05	5.23	5.29	3.76	5.17	4.03	5.69	4.96	4.27	6.03	4.43	.
November	8.98	9.15	9.91	8.60	8.98	4.05	5.31	8.99	6.74	6.76	9.79	7.03	8.67	9.05	10.05	8.11	7.45	1.78
December	2.32	2.03	1.95	1.60	0.49	2.91	3.53	2.43	1.05	0.85	1.53	1.88	1.97	2.36	2.30	1.71	1.15	0.91
Annual	65.02	71.82	73.00	66.94			49 19	66.92	58.86	50.60	68.30	60.27	71.09	68 73	66 67	66.10	61 72	

PRECIPITATION FOR THE YEAR 1889—*Continued.*

	Point Pleasant	Bethlehem	Canonsburg	Carlisle	Centre Valley	McConnellsburg	Westtown	Lewisburg	Mauch Chunk	Nisbet	Charlesville	Lynnport	Tionesta	Gettysburg	Lewistown	Greensburg	Tipton	Coudersport	Coopersburg
January	4.64	1.94		3.49		3.53					3.81							4.80	
February	2.80			1.68		1.65	1.72				1.58							1.90	
March	3.45			1.91		4.76													
April	5.11	4.29		4.56		5.28					4.76							4.50	
May	5.59	4.80		4.53		12.41					11.07							7.90	
June	5.32	5.28		4.59		5.17					4.26							4.80	
July	12.30	9.93				8.23					4.19							7.00	
August	3.75	4.10	1.64	2.49						5.10	1.06		2.40					3.80	
September	8.14	6.14	3.41																
October	5.06	3.29	2.87	3.75	3.09	3.14	5.37	3.04	8.18	7.70	5.05	8.50	4.20	6.47	4.09	8.30	6.12	3.80	2.22
November	8.63	8.71	4.91	9.03	7.88	6.51	8.13	7.13	3.66	4.00	1.42			2.01	2.35		4.49		
December	1.69	1.66	3.30	2.44	2.30	2.44	1.23	2.67											
Annual	65.88																		

APPENDIX L.

BY LAWS, ORGANIZATION, AND REGULATIONS OF THE BOARD.

CONSTITUTION.

The Constitution of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania is the act of legislature establishing the Board, approved June 3, 1885, of which the following is the correct text:

AN ACT

To establish a State Board of Health for the better protection of life and health, and to prevent the spread of contagious and infectious diseases in this Commonwealth.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same,* That the Governor, by and with the advice and consent of the senate, shall appoint six persons, a majority of whom shall be physicians of good standing, graduates of regularly chartered and legally constituted medical colleges, and of not less than ten year's experience in the practice of their profession, and one of whom shall be a civil engineer, who, together with the secretary, the mode of whose appointment is hereinafter provided for, shall constitute and be designated as the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania. Of the six persons first appointed, two shall serve for two years, two for four years, and two for six years, from the first day of July next following their confirmation; and the Governor shall thereafter biennially appoint, by and with the advice and consent of the senate, two persons, of the same professions as those whose terms of office have just expired, to be members of said Board, to hold their offices for six years from the first day of July next following their confirmation, and until their successors are appointed, excepting the secretary, who shall continue in office as hereinafter provided: but any member may be re-appointed. Any vacancy occurring in said Board dur-

Manner of appointment.

Number of members.

Term of service.

ing a recess of the legislature shall be filled by the Governor until the next regular session of the same.

Manner of organization.

SECTION 2. As soon as possible after the appointment of the first six persons as aforesaid, they shall meet in the office of the Secretary of the Commonwealth, and shall proceed, under the direction of the latter officer, to determine by lot which of them shall serve the respective terms of two, four and six years. Before entering upon the duties of the office, they shall take the oath prescribed for state officers by the Constitution of the State, and shall file the same in the office of the Secretary of the Commonwealth, who upon receiving the said oath of office, shall issue to each a certificate of appointment for his respective term of office determined as aforesaid; upon receiving which they shall possess and exercise the powers, and perform the duties, of said board as defined in this act. Immediately after having taken the oath of office, they shall organize by electing one of their number to be president, and by appointing a proper person, who shall be a physician of good standing, of not less than ten years' professional experience, and a graduate of a legally constituted medical college, to be secretary of said Board, who shall hold his appointment until removed by the appointment of his successor or otherwise. The Board may elect one of its own members secretary, in which case the vacancy thus created shall be filled by the Governor in the same manner as a vacancy caused in any other way. The president shall be elected annually. No member of the Board except the secretary shall, as such, receive any salary; but the actual traveling and other expenses of any member, while engaged on the actual duties of the Board, shall be allowed and paid on presentation to, and approval by, the auditor general of an itemized account with vouchers annexed.

Appointment of secretary.

Actual expenses of members to be paid.

Duties of secretary.

SECTION 3. The secretary shall be the executive officer of the Board, and shall have all the powers and privileges of a member of said Board, except in regard to voting upon matters relating to his own office and duties as secretary. He shall receive an annual salary of two thousand dollars, which shall be paid him in the same manner that salaries of other state offices are paid; and such necessary expenses as the auditor general shall audit, on presentation of an itemized account with

Salary of secretary

vouchers annexed and the certificate of the Board, shall be allowed him.

Times and place of meetings.

SECTION 4. The said Board shall meet at least once every six months, and may also hold special meetings as frequently as the proper and efficient discharge of its duties shall require, in the capitol building at Harrisburg (unless otherwise ordered,) and the rules and by-laws of the Board shall provide for the giving of proper and timely notice of all such meetings to every member of the Board. The Secretary of Internal Affairs shall provide and furnish such apartments and stationery as said Board may require in the discharge of its duties. A majority of the members of the Board shall, at any regular, called or adjourned meeting, organize and constitute a quorum for the transaction of business.

Duties and function of board defined.

SECTION 5. The State Board of Health and Vital Statistics shall have the general supervision of the interests of the health and lives of the citizens of the Commonwealth, and shall especially study its vital statistics. It shall make sanitary investigations and inquiries respecting the causes of disease, and especially of epidemic diseases, including those of domestic animals, the sources of mortality, and the effects of localities, employments, conditions, habits, food, beverages and medicines, on the health of the people. It shall also disseminate information upon these and similar subjects among the people. It shall, when required by the Governor or the legislature, and at such other times as it deems it important, institute sanitary inspections of public institutions or places throughout the state. It shall codify and suggest amendments to the sanitary laws of the Commonwealth, and shall have power to enforce such regulations as will tend to limit the progress of epidemic diseases.

Powers of board.

SECTION 6. In cities, boroughs, districts and places having no local board of health, or in case the sanitary laws or regulations in places where boards of health or health officers exist should be inoperative, the State Board of Health shall have power and authority to order nuisances, or the cause of any special disease or mortality, to be abated and removed, and to enforce quarantine regulations as said Board shall direct.

Penalty for violation and neglect.

Any person who shall fail to obey, or shall violate, such order shall, on conviction, be sentenced to pay a

fine of not more than one hundred dollars at the discretion of the court.

Funtions of board in registration.

SECTION 7. It shall be the duty of the State Board of Health and Vital Statistics to have general supervision of the state system of registration of births, marriages and deaths, of prevalent diseases, and of practitioners of medicine, and surgery, to prepare the necessary methods, forms and blanks for obtaining and preserving such records, and to insure the faithful registration of the same in the several counties and in the central bureau of vital statistics at the capital of the state. The said Board shall recommend such forms and amendments of laws as shall be deemed to be necessary for the thorough organization and efficiency of the registration of vital statistics throughout the state. The secretary of the State Board of Health and Vital Statistics shall be the superintendent of registration of vital statistics; as supervised by said Board, the clerical duties and safe-keeping of the bureau of vital statistics thus created shall be provided for by the Secretary of Internal Affairs, who shall also provide and furnish such apartments and stationery as said Board shall require in the discharge of such duties.

Secretary of Internal Affairs to provide stationery and apartments.

Local boards of health and institutions to report to board.

SECTION 8. It shall be the duty of all health officers and boards of health in the state to communicate to said State Board of Health copies of all their reports and publications, and also such sanitary information as may be requested by said Board. And said Board is authorized to require reports and information (at such times, and of such facts, and, generally, of such nature and extent as its by-laws or rules may provide) from all public dispensaries, hospitals, asylums, infirmaries, prisons and schools, and from the managers, principals and officers thereof, and from all other public institutions, their officers and managers, and from the proprietors, managers, lessees and occupants of all places of public resort in the state; but such reports shall only be required concerning matters or particulars in respect of which it may, in its opinion, need information for the proper discharge of its duties.

Scientific investigations.

SECTION 9. Said Board may, from time to time, engage suitable persons to render sanitary service or to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto. But no more than

two thousand dollars shall be expended in any one year for such special sanitary service.

nnual report. SECTION 10. It shall be the duty of said Board, on or before the first Monday of December in each year, to make a report in writing to the Governor of this state upon the sanitary condition and prospects of the state; and such report shall set forth the action of the said Board and its officers and agents, and the names thereof, for the past year, and may contain other useful information pertinent to the objects for which it was created, and shall suggest any further legislative action or precaution deemed proper for the better protection of life and health; and the annual report of said Board shall also contain a detailed statement of the state treasurer of all moneys paid out by or on account of said Board, and a detailed statement of the manner of its expenditures during the year last past, but its total expenditures shall not exceed the sum of five thousand dollars in any one year.

ppropriation. SECTION 11. The sum of ten thousand dollars ($10,000) is hereby appropriated from the treasury for the purposes of this act and the expenditures properly incurred by the authority of said Board and verified by affidavit, subject, however, to the limitations hereinbefore imposed, and shall be paid by the treasurer upon the warrant of the auditor general.

SECTION 12. This act shall take effect immediately, and all acts or parts of acts inconsistent herewith shall be, and are hereby, repeal d.

APPROVED: June 3, 1885.

ROBT. E. PATTISON.

AN ACT

To regulate the publication, binding and distribution of the public documents of this Commonwealth.

SECTION 1. *Be it enacted, etc.*, That from and after the passage of this act the printing, binding, distribution and number of the several public documents of this Commonwealth shall be as follows, to wit:

XIX. Five thousand copies of the annual report of the State Board of Health and Vital Statistics be printed annually, four thousand to be bound in muslin and one thousand in paper: seventeen hundred and fifty thereof for the use of the House of Representatives, one thousand for the use of the Senate, seventy-five thereof for the

use of the Governor, seventy-five thereof for the state librarian for distribution and exchange with the states and territories, five hundred thereof for reserve work, and the remainder thereof for exchange and distribution by the State Board of Health.

APPROVED: The 16th day of April, A. D. 1887.

JAMES A. BEAVER.

BY-LAWS.

The By-Laws of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania are as follows:

ARTICLE I.

OFFICERS OF THE BOARD.

SECTION 1. The officers of the Board shall be a president and secretary, as directed by section two of the act establishing the Board.

SECTION 2. All elections shall be by ballot.

ARTICLE II.

DUTIES OF OFFICERS.

SECTION 1. The president shall preside at the meetings of the Board, preserve order, and perform such other duties as custom and parliamentary usage require. He shall be *ex-officio* a member of all committees.

SECTION 2. The secretary shall keep the records, and conduct all the correspondence of the Board. He shall be custodian of all books, documents, furniture and other property belonging to the Board. He shall give proper and timely notice, in writing, of every regular and called meeting, to each member of the Board, and shall, as executive officer, perform such other duties as are assigned by the act establishing the Board, or by these By-Laws, as the Board may from time to time direct. All communications from the secretary to the Board shall be in writing.

ARTICLE III.

MEETINGS.

SECTION 1. The regular meetings of the Board shall be held on the second Wednesday in May, July and November, at Harrisburg (unless otherwise ordered.) At the meeting in July the election of officers shall be held At the meeting in November the annual report shall be adopted, and at the meeting in May a public address on some sanitary topic shall be delivered.

SECTION 2. Special meetings shall be called by the president, at such time and place as he shall designate, whenever requested in writing by three members of the Board, one of whom shall be the secretary.

SECTION 3 A majority of the members of the Board shall, at any regular, called or adjourned meeting, organize and constitute a quorum for the transaction of business.

ARTICLE IV.

ORDER OF BUSINESS.

SECTION 1. All meetings of the Board shall be called to order at the

appointed hour by the president. In the event of his absence, a chairman *pro tempore* shall be appointed.

SECTION 2. At regular meetings the business shall be conducted as follows:

1. The secretary shall register the names of the members present.
2. The minutes of the last regular meeting shall be read.
3. The minutes of special meetings held since the last regular meeting may be read if called for.
4. Report of the secretary.
5. Reports of standing committees.
6. Reports of special committees.
7. At the meeting in July, nomination and election of a president for the ensuing year; at the meeting in November, appointment of standing committees.
8. Unfinished business.
9. New business.
10 Adjournment.

SECTION 3. At special meetings the following shall be the order of business:

1. Registration of names of members present.
2. Reading of minutes.
3. Presentation of special subject.
4. Presentation of accounts.
5. Adjournment.

ARTICLE V.

REPORT OF THE SECRETARY.

The secretary shall at the meeting in November, make a full report of his official acts during the year ending October 1, preceding, and accompany the same with recommendation of such measures as he shall deem necessary for the preservation of the public health and the faithful execution of the law; and this report shall constitute the basis of the report of the Board to be presented to the Governor on or before the first Monday of December in accordance with the requirements of section 1 of the act constituting this Board.

ARTICLE VI.

STANDING COMMITTEES.

SECTION 1. The following standing committees shall be appointed by the president of the Board at the meeting in November·

1. An executive committee.
2. A committee on registration and vital statistics.
3. A committee on preventable diseases, disinfection and supervision of travel and traffic.

4. A committee on water supply, drainage, sewerage, topography and mines.

5. A committee on public institutions and school hygiene.

6. A committee on adulterations, poisons, explosives and other special sources of danger to life and limb.

7. A committee on sanitary legislation, rules and regulations.

SECTION 2. Such papers, communications or other matter received by the secretary as he may deem proper for the purpose, he shall forward to the chairman of the appropriate committee, after filing the titles and memoranda, which shall be recorded in the secretary's office.

SECTION 3. All reports of committees shall be in writing.

ARTICLE VII.

FINANCES.

SECTION 1. All accounts against the Board shall be filed with the secretary, and may be presented at any meeting of the Board, when they shall be acted on in open session; and all accounts allowed shall be indorsed "Approved by order of the State Board of Health and Vital Statistics," and shall be indorsed by the president and secretary.

SECTION 2. The secretary shall record in a book reserved for that purpose, all accounts of expenditures ordered or made by the Board and its several members, and shall, before presenting any bill, account or voucher to the auditor general, cause a copy of the same to be recorded, and shall have stamped upon each voucher, account or bill. the audit and date, as the executive committee shall provide.

ARTICLE VIII.

EXECUTIVE COMMITTEE.

SECTION 1. The executive committee shall consist of not less than three members, including the secretary of the Board, who shall be secretary of the committee.

SECTION 2. It shall have the general supervision of the finances, purchases, expenses and publications of the Board.

SECTION 3. Its office shall be in the city of Philadelphia until otherwise ordered.

SECTION 4. It shall hold meetings at least quarterly, and as much oftener as it shall deem necessary, and shall meet on the call of the chairman.

SECTION 5. With the approval of the Board or of the executive committee, the secretary shall make requisition upon the Secretary of Internal Affairs for such stationery, printed forms, clerical labor, apartments and furniture as shall be needed for the use of the Board.

SECTION 6. No purchases shall be made or expenditure incurred except by order of the Board or of the executive committee; and the ex-

ecutive committee shall not have power to incur any indebtedness beyond the amount appropriated by law.

ARTICLE IX.

RULES OF ORDER.

In conducting the business of the meetings of the Board, the parliamentary rules governing the legislature of the state of Pennsylvania shall be adopted so far as they are applicable to its deliberations.

ARTICLE X.

SEAL.

The seal of the Board shall be circular in shape, bearing on the circumference the words, "State Board of Health. Pennsylvania. 1885. *Salus Populi Suprema Lex*," and in the center the coat of arms of the Commonwealth.

ARTICLE XI.

AMENDMENTS.

These By-Laws may be altered or amended at any regular meeting of the Board by a two-thirds vote of the members present.

STATE BOARD OF HEALTH AND VITAL STATISTICS OF THE COMMONWEALTH OF PENNSYLVANIA, 1889.

Officers and Members.

President, Hon. David Engelman, M. D , of Easton.

Secretary, Benjamin Lee, M. D., of Philadelphia.

Members, Pemberton Dudley, M. D., 1338 North Fifteenth street, Philadelphia. David Engelman, M. D., 1458 Northampton street, Easton. Joseph F. Edwards, M. D., 224 South Sixteenth street, Philadelphia. J. H. McClelland, M. D., 411 Penn Avenue, Pittsburgh. Howard Murphy, C. E., 326 Walnut street, Philadelphia. George G. Groff, M. D., Bucknell University, Lewisburg. Benjamin Lee, M. D., 1532 Pine street, Philadelphia.

Place of Meeting.—Supreme Court Room, State Capitol, Harrisburg, (unless otherwise ordered.) *Janitor*, John Harner, 1417 North Third street, Harrisburg.

Time of Meeting.—Second Wednesday in May, July and November, at 9.30 A. M.

Standing Committees.

I. *Executive Committee.*—Pemberton Dudley, M. D., Chairman, Howard Murphy, C. E., Joseph F. Edwards, M. D., and Benjamin Lee, M. D., Secretary. Place of meeting: Executive office, 1532 Pine street, Philadelphia. Time of meeting: Last Wednesday in February,

May, August and November. Secretary's address: 1532 Pine street, Philadelphia.

II. *Committee on Registration and Vital Statistics*—Dr. Benjamin Lee and Dr. George G. Groff. Bureau of Registration of Vital Statistics: Department of Internal Affairs, State Capitol, Harrisburg. State Superintendent of Registration of Vital Statistics: Benjamin Lee, M. D. Registrars of Marriages: All clerks of Orphans' Courts. Registrars of Practitioners of Medicine and Surgery: All Prothonotaries.

III. *Committee on Preventable Diseases, Disinfection, and Supervision of Travel and Traffic*—Dr. Joseph F. Edwards and Dr. Pemberton Dudley.

IV. *Committee on Water Supply, Drainage, Sewerage, Topography and Mines*—Mr. Howard Murphy, C. E., and Dr. J. H. McClelland.

V. *Committee on Public Institutions and School Hygiene*—Dr. J. H. McClelland and Mr. Howard Murphy, C. E.

VI. *Committee on Adulterations, Poisons, Explosives and other Special Sources of Danger to Life and Limb*—Dr. Pemberton Dudley and Dr. David Engelman.

VII. *Committee on Sanitary Legislation, Rules and Regulations*—Dr. George G. Groff and Dr. Pemberton Dudley.

The President is a member, ex-officio, of all committees.

Medical Inspectors of the Board.

DISTRICTS.	COUNTIES.	INSPECTORS.
Delaware,	Philadelphia, Delaware, Chester, Montgomery and Bucks,	Dr. W. B. Atkinson, Philadelphia.
Lehigh,	Lehigh, Northampton, Carbon and Monroe,	Dr. Chas. McIntire, Jr., Easton.
Wyoming,	Luzerne, Wyoming, Pike, Lackawanna, Wayne and Susquehanna,	Dr. L. H. Taylor, Wilkes-Barre.
Susquehanna,	Lancaster, York and Dauphin,	Dr. P. A. Hartman, Harrisburg.
Schuylkill,	Berks, Lebanon and Schuylkill,	Dr. W. Murray Weidman, Reading.
Northumberland	Northumberland, Union, Snyder, Montrose and Columbia,	Dr. Wm. Leiser, Jr., Lewisburg.
Lycoming,	Lycoming, Tioga, Potter, Bradford and Sullivan,	Dr. E. D. Payne, Towanda.
Cumberland,	Cumberland, Adams, Franklin and Perry,	Dr. R. L. Sibbet, Carlisle.
Juniata,	Juniata, Mifflin and Huntingdon,	Dr. A. B. Brumbaugh, Huntingdon.
Central,	Centre, Clearfield, Clinton, Blair and Cambria,	Dr. C. B. Dudley, Altoona.
Western Slope,	Indiana, Jefferson, Elk, Cameron, McKean, Clarion and Armstrong,	Dr. Spencer M. Free, Beechtree.
Southern Tier,	Fulton, Bedford, Somerset and Fayette,	Dr. C. L. Gummert, Brownsville.
Allegheny,	Allegheny, Washington, Greene, Westmoreland, Butler, Beaver and Lawrence,	Dr. J. R. Thompson, Pittsburgh.
Lake,	Erie, Crawford, Warren, Mercer, Venango and Forest,	Dr. J. L. Stewart, Erie.

REGULATIONS OF THE BOARD.

REGULATION IN REGARD TO THE ABATEMENT AND REMOVAL OF NUISANCES.

Whenever a complaint is made in writing to the Secretary of the Board of the existence of a nuisance, he shall forthwith, as executive officer of the Board, investigate the matter, and shall determine whether the alleged nuisance is detrimental to the public health, or the cause of any special disease or mortality; and in case he shall so find, then he shall notify the owner, agent or occupier of said premises, in writing, of such finding, and the executive officer shall thereupon order and direct the abatement and removal of the same within - -— days; and in the event of failure of said owner, agent or occupier of said property to abate and remove the nuisance, then the executive officers shall proceed to abate and remove the same, and shall employ all the force necessary to do so, and shall proceed by warrant, arrest and indictment to convict the party failing to obey said order of abatement and removal.

PROVISIONAL REGULATIONS FOR PREVENTING HOUSE YARDS, STREETS, SLAUGHTER HOUSES, STOCK YARDS, HOG-PENS, BONE-BOILING AND FAT-RENDERING AND OTHER SIMILAR ESTABLISHMENTS FROM BEING OR BECOMING PREJUDICIAL TO THE PUBLIC HEALTH.

Nuisances Defined.

1. Whatever is dangerous to human life or health, and whatever renders soil, air, water or food impure or unwholesome, are declared to be nuisances and to be illegal; and every person having aided in creating or contributing to the same, or who may support, continue or retain any of them, shall be deemed guilty of a violation of these regulations.

House-Refuse, Garbage, Etc.

2. No house-refuse, offal, garbage, dead animals, decaying vegetable matter, or organic waste substance of any kind, shall be thrown upon any street, road, ditch, gutter, or public place, and no putrid or decaying animal or vegetable matter shall be kept in any house, cellar or adjoining out-buildings for more than twenty-four hours.

Noxious Trades.

3. No person or company shall erect or maintain any manufactory or place of business dangerous to life or detrimental to health, or where unwholesome, offensive or deleterious odors, gas, smoke, deposit or exhalations are generated, within one mile of the limits of any city or borough, without the permit of the Board of Health or borough council of said city or borough, and all such establishments shall be kept clean and wholesome so as not to be offensive or prejudicial to public health, nor shall any offensive or deleterious waste substance, refuse or injurious matter be allowed to accumulate upon the premises or be

thrown or allowed to run into any public waters, stream, water-course, street, road or public place. And every person or company conducting such manufacture or business shall use the best approved and all reasonable means to prevent the escape of smoke, gasses and odors, and to protect the health and safety of all operatives employed therein.

4. The business of bone and horse-boiling shall not be allowed, unless conducted under cover, the building to be provided with smoke-consumers, and a due regard be had to cleanliness in the disposition of the offal. No bone-boiling establishment or depository of dead animals shall be kept or erected in any part of this Commonwealth which is not under the jurisdiction of a local board of health, without a permit from the board of health or borough council of the nearest city or borough.

5. No permit shall be granted to any person or persons to carry on the business of boiling bones and dead animals, until after a careful inspection of the locality, buildings and apparatus, and of the plans for conducting the business, by an accredited Inspector of the State Board of Health, or, if such inspector be not accessible, then by an inspector appointed for the purpose by the board of health or borough council of the nearest city or borough.

6. No bone-boiling establishments or depositories of dead animals shall be kept or erected in or near to a thickly-inhabited neighborhood.

7. The floors of all bone-boiling establishments and depositories of dead animals shall be paved with asphalt or with brick or stone, well laid in cement, or with some other impervious material, and shall be well drained. All such establishments shall have such an adequate water supply as will enable thorough cleanliness to be maintained.

8. The boiling of bones and dead animals, etc., shall be conducted in steam-tight kettles, boilers or caldrons, from which the foul vapors shall first be conducted through scrubbers or condensers, and then into the back part of the ash-pit of the furnace fire, to be consumed, or by other apparatus equally efficient in preventing or counteracting the offensive effluvia.

9. When bones are being dried after boiling, they shall be placed in a close chamber, through which shall be passed, by means of pipes, large volumes of fresh air, the out-let pipe terminating in the fire-pit.

10. All proprietors of bone-boiling establishments not having, on the first day of July, 1886, permits to carry on the business, and violating these regulations, shall be liable to prosecution for failing to obey this order and also to an indictment at common law for creating and maintaining a nuisance.

11. The permit clerk of each local board of health or borough council shall have provided a book in which to enter the names of all persons engaged in the business of boiling bones and having depositories of dead animals; also, the location of works and appliances as reported

by the inspector, whether licensed or not, the number and date of permit and remarks.

12. No person or persons without the consent of the board of health or borough council of the nearest city or borough, shall build or use any slaughter house within the limits of this commonwealth: and the keeping and slaughtering of all cattle, sheep and swine, and the preparation and keeping of all meats, fish, birds or other animal food, shall be in the manner best adapted to secure and continue their wholesomeness as food; and every butcher or other person owning, leasing or occupying any place, room or building wherein any cattle, sheep or swine have been or are killed or dressed, and every person being the owner, lessee or occupant of any room or stable wherein any animals are kept, or of any market, public or private, shall cause such place, room or building, stable or market, to be thoroughly cleansed and purified, and all offal, blood, fat, garbage, refuse and unwholesome and offensive matter to be removed therefrom at least once in every twenty-four hours after the use therof for any of the purposes herein referred to, and shall also at all times keep all wood-work, save floors and counters, in any building, place or premises aforesaid, thoroughly painted or whitewashed; and the floors of such building, place or premises shall be so constructed as to prevent blood or foul liquids or washings from settling in the earth beneath.

13. No blood-pit, dung-pit, offal-pit, or privy-well shall remain or be constructed within any slaughter house. Any one offending against this rule shall be guilty of creating and maintaining a nuisance prejudicial to the public health, and shall be required to remove the nuisance within ten days from the date of notice.

14. The owners, agents, or occupiers of all slaughter houses are required, during the months of June, July, August and September, to distribute twice in each week not less than twenty-five pounds of chloride of lime about the premises, and also to remove the contents of any manure-pit or manure pile on the premises, once in each week, the said premises and contents of manure-pits being hereby declared to be nuisances prejudicial to the public health, unless subject to frequent disinfection and cleaning as herein indicated.

15. *All constables and supervisors are enjoined, and all citizens are respectfully desired,* to give information to the State Board of Health of any violation of the health laws, or of the regulations of the Board, so that the sanitary measures adopted by the latter to ensure the health of the people may be fully carried out, and all offenders promptly punished.

NOTE.—Section six of the act of June 3, 1885, confers upon the State Board of Health power and authority to *order nuisances to be abated and removed in cities, boroughs, districts and places* having no local board of health. Any person violating or failing to obey such order becomes liable, on conviction, *to a fine of one hundred dollars.*

REGULATION IN REGARD TO THE SANITARY SUPERVISION OF TRAVEL AND TRAFFIC.

Upon satisfactory information of the approach to, or the transit through, the commonwealth of Pennsylvania, of infected persons or goods, it shall be the duty of the Secretary, as executive officer of the Board, to cause the same to be stopped at the state line, or, if found within the limits of the state, to cause such persons or goods to be removed from cars, stages, vessels, boats or other conveyances, and securely isolated and disinfected; and he may, if, in his judgment, the emergency is such as to demand it, call a meeting of the "Committee on Travel and Traffic," to which his action shall be submitted, with his reasons therefor, in writing. But, in cases coming under the jurisdiction of national or municipal quarantine authorities, he shall co-operate with said authorities in all such action.

REGULATION OF TRAVEL AND TRAFFIC.

Regulations in Regard to Disinterment and Transportation of Dead Bodies.

Disinterment of Bodies.

RULE I. The removal of any body from its place of original interment is declared to be a nuisance dangerous to the public health, and is prohibited, unless the same be done under the direction and by permission of the local board of health or borough council.

RULE II. The above rule applies as well to the removal of a body from one grave or vault to another in the same cemetery as to its removal to another burial ground or place.

RULE III. The removal of dead bodies from any burial ground situated within the built-up portions of any city or borough is forbidden between April 1 and October 15.

RULE IV. The disinterment of the body of any person who died of any contagious or infectious disease is strictly prohibited, unless by special authority, and upon such conditions as the local board of health or borough council may impose.

Transportation of Bodies.

RULE I. The transportation of bodies of persons who shall have died from small pox, Asiatic cholera, typhus fever or yellow fever, is strictly forbidden.

RULE II. From October 15 to April 1, all other dead bodies may be transported without restriction, except those who shall have died of diphtheria, scarlet fever, typhoid fever or measles, which must be enclosed, as prescribed in Rule III.

RULE III. From April 1 to October 15, all dead bodies, when presented for transportation, must be enclosed in air-tight zinc, copper or lead-lined wooden boxes, or in air-tight iron caskets; or, if in any other form of coffin, said coffin must be in a hermetically sealed box, enclosed in a manner satisfactory to the local board of health, health officer or borough council.

RULE IV. No person or article which has been exposed to the contagion can accompany the body.

RULE V. Every dead body must be accompanied by a physician's certificate of death, and a certificate from the shipping undertaker that the body has been prepared for transportation in accordance with the rules of the State Board of Health of the Commonwealth of Pennsylvania.

RULE VI. In receiving any dead body which has been shipped from beyond or within the states of New York, New Jersey, Delaware, Maryland, West Virginia or Ohio, or the Province of Ontario, the rules of the State or Provincial Boards of Health of the same must be respected, and their transit permits will be honored without subjecting the body to delay, provided such rules do not conflict with any of the preceding rules in these regulations.

RULE VII. The following shall be the form of a transit permit for the transportation of a dead body within, into, or out of, the limits of the commonwealth of Pennsylvania:

NOTE.—The rules and regulations of the State Board of Health are laws to be obeyed by every individual in the State.

TRANSIT PERMIT.

Issued at ..... *...Co., Pa.*

Issued by ....

To whom issued, ...

Name of Deceased, ...

Date of Death, ...

Name of person or Carrier in charge, ...

Date of Transit, ...

(BACK OF ABOVE PERMIT.)

☞ Railroad and Steamboat Agents, Ferry-Masters and all Carriers that convey the remains over the limits of the county where the death occurred will retain one of the Coupons hereto attached, and deliver the body only to the persons holding this permit. The name of the deceased must appear on the Coupons, which will be returnable to the city or place through or out of which the body is first conveyed, or to such authority as may be directed by the person who issued the Permit.

The 1st *Coupon should be taken by the carrier who transports the body from the county where the death occurred and the* 2d *should be taken by Carrier or Agent of Transportation upon the route beyond said county, and it may be so taken at either terminus of the distance over which the second stage of transportation extends, as the local sanitary regulations may require; but whoever detaches and takes said* 2d *Coupon must write across the back of the Permit, as well as upon the* 2d *Coupon itself in the space at the left of these directions, as follows:*

2d Coupon taken at ..... *by* .....

Such an indorsement will answer instead of further coupons wherever the body is conveyed; and the Permit is to be surrendered at the place of burial. It, as well as every Coupon, should be preserved.

2d Coupon taken at.....

by.... ....

SECOND COUPON. *taken at*.....
by.....

FIRST COUPON.

(The size of this permit without the stub or 10x4 inches.

TRANSIT.

[Stub to be retained by official issuing Permit.]

TRANSIT PERMIT.

1. *Issued to* .....
2. *Name of Deceased,* ....
(If a minor, give parents' name.)
.....
3. *Interment at* .....
4. *Date of Death,* ..... *Age,*...
5. *Place of Death,* ....
6. *Cause of Death,* .....
7. *Certified by*..... .....
.....*M. D.*

☞ This Permit must in all cases accompany the body to its Destination.

FORM 7.

Commonwealth of Pennsylvania.

[To be issued by any State or Local Health Official.]

TRANSIT PERMIT. [For Public Carriers.]

R. R. Agents and all others in charge see Back of Permit.

Office of.....*County.*

.....*189*

Permission is hereby given to remove the remains of .....

aged.....*, who died at* .....
(City, borough, or township and county.)

on the....*day of*.....*189; the cause of death being*... .....

and a Transit Permit being asked for burial at..... .. ..

in the State of..... ...

(*Signed by*).....

Name of Undertaker or person in charge of the Transit. .....
(Official title.)

.....
(P. O. address.)

Coupon No. 3, to Transit Permit of .....
(Name.)
.....*who died at*
.....
Before this body leaves.....the Carrier or Transportation Agent will tear off and keep this Coupon. If otherwise detached from the permit the Coupon must not be received. (*See back of Permit.*)

Coupon No. 1, to Transit Permit of .....
(Name.)
.....*who died at*
.....
Before this body leaves.....the Carrier or Transportation Agent will tear off and keep this Coupon. If otherwise detached from the permit the Coupon must not be received. (*See back of Permit.*)

REGULATION IN REGARD TO THE INTER-STATE NOTIFICATION OF THE EXISTENCE OF INFECTIOUS AND CONTAGIOUS DISEASES.

The following are the resolutions adopted by the International Conference of Boards of Health, at Toronto, October 6, 1886, with slight verbal modifications:

WHEREAS, It is necessary for the protection and preservation of the public health that prompt information should be given of the existence of cholera, yellow fever or small pox; be it *Resolved*,—

1. That it is the sense of the National Conference of State Boards of Health, that it is the duty of each State and Provincial Board of Health within whose jurisdiction any of said diseases may occur to furnish immediate information of the existence of such disease to boards of health of neighboring states and provinces, and to local boards in such states as have no central board, in which the duty of notification shall lie upon the local boards.

2. That upon the prevalence of rumor of the existence of pestilential disease in any state or province, if positive, definite information thereupon be not obtainable from the proper health authorities, this conference holds that the health officials of another state are justified in entering the before-mentioned state or province for the purpoes of investigating and establishing the truth or falsity of such reports.

3. That whenever practicable, the investigations undertaken under the preceding section shall be made with the coöperation of the state or local health authorities.

4. That any case which presents symptoms leading to serious suspicion of the existence of one of the aforenamed diseases shall be treated as suspicious, and reported as provided for in cases in which the diagnosis is certain.

5. That any case respecting which reputable and experienced physicians disagree as to whether the disease is or is not pestilential, shall be reported as suspicious

6. That any suspected case respecting which efforts are made to conceal its existence, full history and true nature, shall be deemed suspicious and so reported.

7. That in accordance with the provisions of the foregoing resolutions, the boards of health of the United States and Canada represented at this conference, do pledge themselves to an interchange of information as herein provided.

I certify that the foregoing resolutions were endorsed, and adopted as a regulation, by the State Board of Health and Vital Statistics of the commonwealth of Pennsylvania, at a regular meeting held November 10, 1886.

BENJAMIN LEE,
Secretary.

Administration is suggested in regard to the inter-state notification of communicable and notifiable diseases, adopted by the National Conference of State Boards of Health at Washington, September 5, 1905, and by the State Board of Health of Pennsylvania, November 1, 1905.

1. All communicable diseases hereinafter mentioned prevalent in certain areas, in which case it shall state certain lines of travel shall be subjected to all state and provincial boards of health within said areas or along said lines of communication.

2. In the instance of small pox, quarantine, railway sleeper and express cars shall be as much interfered with as may be necessary, as the judgment of the case may demand.

3. In the instance of diphtheria, scarlet fever, typhoid fever, anthrax or glanders, which require when possible that be supplied in which shall be maintained as far as known, the names implicated and the [illegible] of prevalence.

APPENDIX M.

LIST OF BOOKS AND PAMPHLETS RECEIVED.

CATALOGUE OF BOOKS AND PAMPHLETS RECEIVED BY THE LIBRARY OF THE STATE BOARD OF HEALTH, FROM DECEMBER 1st, 1888, TO DECEMBER 1st, 1889

BOOKS.

Annual Report of the State Board of Health of Vermont, (3 copies.)

Annual Report of the State Board of Health of New Hampshire, (7 copies.)

Annual Reports of the State Board of Health of California to 1883, (7 copies)

Eastern Middle Anthracite Field Atlas, Part 2, from the Geological Survey.

Transactions of the Maine Medical Association for the year 1888.

Annual Reports of the State Board of Health of Connecticut for the years 1879, 1880, 1881 and 1882.

Transactions of the Medical Association of Alabama for the years 1885 and 1887.

Forty-sixth Registration Report of Boston, Massachusetts, for the year 1887.

Tenth Biennial Report of the State Board of Health of California.

Transactions of the Ohio State Medical Society for the year 1888.

Annual Reports of the city of Boston, Massachusetts, for 1886 and 1887.

Report of the Pennsylvania State Board of Agriculture for the year 1888, (2 copies.)

Biennial Report of the State Board of Health of West Virginia.

Twelfth Annual Report of the State Board of Health of New Jersey.

Annual Report of the City of Reading, Pa.

Third Annual Report of the Allegheny City General Hospital.

Fourth Annual Report of the City of Portland, Maine.

Report on Sewerage of Mystic and Charles River Valleys.

Second and Seventh Annual Reports of the State Board of Health of Rhode Island.

Annual Report for 1887 of the Secretary of Internal Affairs for Pennsylvania, on Railroads, Canals, Telegraphs, and Telephones in Pennsylvania.

Annual Reports for the years 1886, 1887 and 1888, of the State Board of Health of Minnesota.

Smulls Legislative Hand Book, 1889.

Second, Third, Fifth, Sixth, Seventh, Eighth, Tenth and Eleventh, and Biennial Report 1881 and 1882, of the State Board of Health of Minnesota.

Fourth Annual Report of the City of Newport, Rhode Island.

Annual Report of the Health Commissioner, City of Baltimore.

Second Biennial Report of the North Carolina State Board of Health, (6 copies.)

Annual Report of the State Board of Health of Connecticut, (2 copies.)

Water Supplies of Illinois, (2 copies.)

Ninth Annual Report of the State Board of Health of Illinois, (6 copies.)

Transactions of the American Institution of Homœopathy, Pemberton Dudley, M. D.

Annual Report of Toledo Board of Health.

Annual Report of the State Board of Health of Kansas, (5 copies.)

Seventh Biennial Report of the State Board of Health of Maryland.

Annual Report of the State Committee on Lunacy.

Annual Report of the United States Marine Hospital Service.

Geological Survey of Pennsylvania, (4 copies.)

Annual Report for 1888 of the State Board of Health of Wisconsin.

Third Report of the City of Keokuk, Iowa.

Transactions of the Vermont State Medical Society.

Twenty-first Report of Vermont Legislature.

Twelfth Annual Report of Health Commissioners of St. Louis, Missouri.

Health Report for City of Detroit, 1889.

Annual Report State Board of Health of Ontario, Canada, 1888.

Report of First Annual Convention North Carolina Sanitary Association.

Pamphlet Laws of Pennsylvania for 1889, (4 copies.)

Annual Report for 1888 of the State Board of Health of Rhode Island, (2 copies.)

Annual Report of the city of Newton.

Report of the Tennessee State Medical Society for 1889.

Annual Report of the Indiana State Board of Health for 1888.

Annual Report for 1887 of Geological Survey of Pennsylvania, (3 parts.)

Second Annual Report of Bureau of Water, Philadelphia. Edwin Fitler, Mayor.

Annual Report of the Bureau of Health of Pennsylvania for 1888.

Transactions of 91st Session of the Medical and Chururgical Faculty, State Medical Association.

Annual Report of the State Board of Health of Massachusetts.

Annual Reports of the State Board of Health of Massachusetts for 1870 and 1874.

Annual Reports of the State Board of Health of Rhode Island for 1879 and 1883.

Annual Report of Board of Health of Detroit for 1883, 1884 and 1885. O. W. Wright, A. M., M. D., Health Officer.

Annual Reports State Board of Health of New Jersey, for 1886 and 1887.

PAMPHLETS.

Rules and Regulations of the Health Department of Philadelphia on House Drainage, etc. Wm. P. Troth, chief clerk.

The Journal of Comparative Medicine and Surgery. Professor D. M. M. Cochran.

Annual Report of Louis Wagner, Esq.

"Malaria and the causes of Periodic Fevers." Dr. Henry B. Baker, Lansing, Michigan.

Annual Report for 1887 of the State Board of Health of Alabama.

Proposed Act for Incorporation and Government of Cities of the third class, Reading Pa.

Journal of Elisha Mitchell Scientific Society. F. P. Venable, Ph. D.

Ticketed Houses of Glasgow. England, Dr. Russell.

Report of Committee on Pollution of Water Supply, Secretary New Hampshire State Board of Health, (2 copies.)

First Annual Message. Edwin H. Fitler, Esq., Louis Wagner.

Laws relating to Public Health in New Jersey. C. A. Hunt, Inspector.

Laws relating to Public Health in Delaware. E B. Frazer, Secretary.

Laws relating to Public Health in Connecticut. Professor C. A. Lindsley.

Third Annual Report Instructor in Hygiene, 1888. Phineas Baker, Secretary.

Sixteenth Annual Report City of Cleveland, 1889. G. C. Ashman.

Tenth Annual Report of Titusville, Pa., 1888. Thomas Hobart, Secretary.

Annual Report Connecticut Medical Society for 1888. Gideon C. Segur.

Biennial Message, Governor Illinois, 1889. John H. Rauch, M. D.

Regulation of the Provincial Board of Health of Quebec, 1889. E. Persillier Lachapelle, M. D., President, Montreal, (4 copies.)

Annual Report of Health Department of Erie City, 1888. Arthur A. Woods, M. D.

Medical Education and Medical Colleges in United States and Canada, 1765, 1886. John H. Rauch, M. D.

Public Health a public duty. Charles N. Hewitt, M. D.

Poisoning by chrome yellow, used as a cake dye. D. D. Stewart, M. D.

American Journal of Pharmacy, (2 copies. John M. Maisch.)

Inspection of Tenement Houses in Boston, 1888. Professor Dwight Porter.

Industrial Education in Europe. L. W. Miller.

Annual Report of State Hospital for the Insane at Warren. Dr. John Curwen.

Report on Medical Education and Medical Colleges in United States and Canada. John M. Rauch, M. D., Secretary State Board of Health of Illinois, (7 copies.)

Ninth Annual Report of the State Board of Health of South Carolina.

Eighth Annual Report of the Public Education Association of Philadelphia.

Sanitary Requirements of a Dairy Farm.

Thirty-sixth Annual Report, Pennsylvania Training School for Feeble Minded Children. Isaac M. Kerlin, M. D.

Fourth Biennial Report of the Minnesota State Board of Health.

Report of Dairy Commissioners of New Jersey, 1888. Wm. K. Newton.

Scientific Temperance Instruction. Mrs. Mary H. Hunt.

Twelfth Annual Report of State Board of Health of New Jersey.

Report of the Board of Health of Bradford, 1888. Hon. R. A. Dempsey, Mayor.

Sewerage System for the city of Reading. C. P. Bassetts, C. E.

Report of Proceedings and Address at a Sanitary Convention held at Hastings, Michigan. Dr. H. B. Baker, Lansing, (2 copies.)

Quarantine Conference Proceedings held at Montgomery, Alabama, March 7, 1889. Dr. Jerome Cochran, (12 copies.)

Report of Willis Tucker, Analyst.

Annual Report of the State Board of Health of Ontario, Canada, for 1888. Dr. Peter H. Bryce.

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